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NATIONAL BODY-BURDEN DATABASE

CHEMICALS IDENTIFIED IN HUMAN BIOLOGICAL MEDIA

1984

VOLUME VII, Part 2

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DATABASE RECORDS

Nondrugs

Acetaldehyde
75-07-0
C2-H4-O
MW 44.05, MP -123.5 C, BP 20.8 C

Tissue	Cases Exposure Route	Range	Mean	General Information
8695 Blood	a) 2 b) 10 c) 18 d) 27 Ingestion	a) 30-1 umol/l b) 8-1 umol/l c) 30-1 umol/l d) 5-1 umol/l	a) Not given b) Not given c) Not given d) Not given	a) 1 and 6 hr after 0.5 g ethanol, in alcoholics deficient in aldehyde dehydrogenase isozyme I b) Alcoholics with normal isozyme I c) Controls deficient in ALDH isozyme I d) Controls with normal isozyme Ranges of means. Japanese alcoholics and healthy controls. GC
BLOOD; DELIBERATE EXPOSURE; JAPAN; DRUG ABUSE; DRUGS; COMPARATIVE EVALUATIONS; ALCOHOLIC BEVERAGES; METABOLISM Harada, S.; Agarwal, D.P.; Goedde, H.W.; Takagi, S. 1983 Pharmacology Biochemistry and Behavior 18 Suppl.1:139-140				

Acetic acid, (2,4-dichlorophenoxy)-
94-75-7
C8-H6-Cl2-O3
MW 221.04, MP 138 C, BP 160 C at 0.4 mm Hg

Tissue	Cases Exposure Route	Range	Mean	General Information
8696 Bile	1 Ingestion	Not applicable	340 mg/L	Autopsy samples after unknown dose of Killex (a mixture of 100 g 2,4-D/L, 50 g mecoprop/L, 9 g dicamba/L). Death within approximately 5 hr. 61 yr old suicide victim with history of mental illness and chronic alcoholism Comatose, distress, low blood pressure, peculiar odor on breath, heavy breathing, distended abdomen, vomiting Elevated white cell count. At autopsy, large volume of blood in pleural cavity HPLC
DELIBERATE EXPOSURE; SUICIDE; AUTOPSIES; PESTICIDES; HERBICIDES; BLOOD; URINE; BILE; LIVER Fraser, A.D.; Isner, A.F.; Perry, R.A. 1984 Journal of Forensic Sciences 29(4):1237-1241				

Tissue	Cases Exposure Route	Range	Mean	General Information
8697 Bile	1 Ingestion	Not given	154.8 ug/g	Postmortem. Ingested 1200 mg/kg chlorophenoxy acetic acids (360 mL Dexol, 360 mL Weed-B-Gone M, few granules D-Con concentrate). Patient died at 36 hr. 26 yr old male, committed suicide, CA Coma, myoclonus, pinpoint pupils, cardiac arrhythmias, progressive hypotension, oliguria. Death after episodes of asystole. Congested, edematous lungs, denuded duodenal mucosa with recent hemorrhage, diffuse mild liver necrosis. HPLC; GC

(next page)

Acetic acid, (2,4-dichlorophenoxy)-
94-75-7
C8-H6-Cl2-O3
MW 221.04, MP 138 C, BP 160 C at 0.4 mm Hg

(continued)

Tissue	Cases Exposure Route	Range	Mean	General Information
8698 Blood	1 Ingestion	Not given	389.5 ug/g	Postmortem. Ingested 1200 mg/kg chlorophenoxy acetic acids (360 mL Dexol, 360 mL Weed-B-Gone M, few granules D-Con concentrate). Patient died at 30 hr. 26 yr old male, committed suicide, CA Coma, myoclonus, pinpoint pupils, cardiac arrhythmias, progressive hypotension, oliguria. Death after episodes of asystole. Congested, edematous lungs, denuded duodenal mucosa with recent hemorrhage, diffuse mild liver necrosis. HPLC; GC
BLOOD PLASMA; BILE; BRAIN; CEREBROSPINAL FLUID; BLOOD; LIVER; PANCREAS; HEART; DIAPHRAGM; KIDNEYS; DELIBERATE EXPOSURE; CALIFORNIA; SUICIDE; CASE HISTORIES; AUTOPSIES; HERBICIDES; PESTICIDES; INSECTICIDES; ORGANOPHOSPHATES Osterloh, J.; Lotti, M.; Pond, S.M. 1983 Journal of Analytical Toxicology 7:125-129				

Tissue	Cases Exposure Route	Range	Mean	General Information
8699 Blood	1 Ingestion	Not applicable	520 mg/L	Autopsy samples after unknown dose of Killex (a mixture of 100 g 2,4-D/L, 50 g mecoprop/L, 9 g dicamba/L). Death within approximately 5 hr. 61 yr old suicide victim with history of mental illness and chronic alcoholism Comatose, distress, low blood pressure, peculiar odor on breath, heavy breathing, distended aldomen, vomiting Elevated white cell count. At autopsy, large volume of blood in pleural cavity HPLC
DELIBERATE EXPOSURE; SUICIDE; AUTOPSIES; PESTICIDES; HERBICIDES; BLOOD; URINE; BILE; LIVER Fraser, A.D.; Isner, A.F.; Perry, R.A. 1984 Journal of Forensic Sciences 29(4):1237-1241				

Tissue	Cases Exposure Route	Range	Mean	General Information
8700 Blood, plasma	1 Ingestion	321.0-300.9 ug/g	Not given	1.6-30 hr, peak 540.9 ug/g at 21 hr. Ingested 1200 mg/kg chlorophenoxy acetic acids (360 mL Dexol, 360 mL Weed-B-Gone M, few granules D-Con concentrate). Patient died at 30 hr. 26 yr old male, committed suicide, CA Coma, myoclonus, pinpoint pupils, cardiac arrhythmias, progressive hypotension, oliguria. Death after episodes of asystole. Congested, edematous lungs, denuded duodenal mucosa with recent hemorrhage, diffuse mild liver necrosis. HPLC; GC

(next page)

Acetic acid, (2,4-dichlorophenoxy)-
94-75-7
C8-H6-Cl2-O3
MW 221.04, MP 138 C, BP 160 C at 0.4 mm Hg

(continued)

Tissue	Cases Exposure Route	Range	Mean	General Information
8701 Brain	1 Ingestion	a) Not given b) Not given c) Not given	a) 186.4 ug/g b) 208.5 ug/g c) 254.8 ug/g	a) Gray matter (frontal lobe) b) White matter (frontal lobe) c) Brain stem Postmortem. Ingested 1200 mg/kg chlorophenoxy acetic acids (360 mL Dexol, 360 mL Weed-B-Gone MJ, few granules D-Con concentrate). Patient died at 30 hr. 26 yr old male, committed suicide, CA Coma, myoclonus, pinpoint pupils, cardiac arrhythmias, progressive hypotension, oliguria. Death after episodes of asystole. Congested, edematous lungs, denuded duodenal mucosa with recent hemorrhage, diffuse mild liver necrosis. HPLC; GC
8702 Cerebrospinal fluid	1 Ingestion	Not given	96.7 ug/g	Postmortem. Ingested 1200 mg/kg chlorophenoxy acetic acids (360 mL Dexol, 360 mL Weed-B-Gone M, few granules D-Con concentrate). Patient died at 30 hr. 26 yr old male, committed suicide, CA Coma, myoclonus, pinpoint pupils, cardiac arrhythmias, progressive hypotension, oliguria. Death after episodes of asystole. Congested, edematous lungs, denuded duodenal mucosa with recent hemorrhage, diffuse mild liver necrosis. HPLC; GC
8703 Record Deleted				
8704 Diaphragm	1 Ingestion	Not given	288.1 ug/g	Postmortem. Ingested 1200 mg/kg chlorophenoxy acetic acids (360 mL Dexol, 360 mL Weed-B-Gone M, few granules D-Con concentrate). Patient died at 30 hr. 26 yr old male, committed suicide, CA Coma, myoclonus, pinpoint pupils, cardiac arrhythmias, progressive hypotension, oliguria. Death after episodes of asystole. Congested, edematous lungs, denuded duodenal mucosa with recent hemorrhage, diffuse mild liver necrosis. HPLC; GC
8705 Heart	1 Ingestion	Not given	301.2 ug/g	Left ventricle. Postmortem. Ingested 1200 mg/kg chlorophenoxy acetic acids (360 mL Dexol, 360 mL Weed-B-Gone M, few granules D-Con concentrate). Patient died at 30 hr. 26 yr old male, committed suicide, CA Coma, myoclonus, pinpoint pupils, cardiac arrhythmias, progressive hypotension, oliguria. Death after episodes of asystole. Congested, edematous lungs, denuded duodenal mucosa with recent hemorrhage, diffuse mild liver necrosis. HPLC; GC

(next page)

Acetic acid, (2,4-dichlorophenoxy)-
94-75-7
C8-H6-Cl2-O3
MW 221.04, MP 138 C, BP 160 C at 0.4 mm Hg

(continued)

Tissue	Cases Exposure Route	Range	Mean	General Information
8706 Kidney	1 Ingestion	Not given	315.0 ug/g	Postmortem. Ingested 1200 mg/kg chlorophenoxy acetic acids (360 mL Dexol, 360 mL Weed-B-Gone M, few granules D-Con concentrate). Patient died at 30 hr. 26 yr old male, committed suicide, CA Coma, myoclonus, pinpoint pupils, cardiac arrhythmias, progressive hypotension, oliguria. Death after episodes of asystole. Congested, edematous lungs, denuded duodenal mucosa with recent hemorrhage, diffuse mild liver necrosis. HPLC; GC
BLOOD PLASMA; BILE; BRAIN; CEREBROSPINAL FLUID; BLOOD; LIVER; PANCREAS; HEART; DIAPHRAGM; KIDNEYS; DELIBERATE EXPOSURE; CALIFORNIA; SUICIDE; CASE HISTORIES; AUTOPSIES; HERBICIDES; PESTICIDES; INSECTICIDES; ORGANOPHOSPHATES Osterloh, J.; Lotti, M.; Pond, S.M. 1985 Journal of Analytical Toxicology 7:126-129				

Tissue	Cases Exposure Route	Range	Mean	General Information
8707 Liver	1 Ingestion	Not applicable	540 mg/L	Autopsy samples after unknown dose of Killex (a mixture of 100 g 2,4-D/L, 50 g mecoprop/L, 9 g dicamba/L). Death within approximately 5 hr. 61 yr old suicide victim with history of mental illness and chronic alcoholism Comatose, distress, low blood pressure, peculiar odor on breath, heavy breathing, distended abdomen, vomiting Elevated white cell count. At autopsy, large volume of blood in pleural cavity HPLC
DELIBERATE EXPOSURE; SUICIDE; AUTOPSIES; PESTICIDES; HERBICIDES; BLOOD; URINE; BILE; LIVER Fraser, A.D.; Isner, A.F.; Perry, R.A. 1984 Journal of Forensic Sciences 29(4):1237-1241				

Tissue	Cases Exposure Route	Range	Mean	General Information
8706 Liver	1 Ingestion	Not given	295.5 ug/g	Postmortem. Ingested 1200 mg/kg chlorophenoxy acetic acids (360 mL Dexol, 360 mL Weed-B-Gone M, few granules D-Con concentrate). Patient died at 30 hr. 26 yr old male, committed suicide, CA Coma, myoclonus, pinpoint pupils, cardiac arrhythmias, progressive hypotension, oliguria. Death after episodes of asystole. Congested, edematous lungs, denuded duodenal mucosa with recent hemorrhage, diffuse mild liver necrosis. HPLC; GC

(next page)

Acetic acid, (2,4-dichlorophenoxy)-
94-75-7
C8-H6-Cl2-O3
MW 221.04, MP 138 C, BP 160 C at 0.4 mm Hg

(continued)

Tissue	Cases Exposure Route	Range	Mean	General Information
8709 Pancreas	1 Ingestion	Not given	220.9 ug/g	Postmortem. Ingested 1200 mg/kg chlorophenoxy acetic acids (860 mL Dexol, 360 mL Weed-B-Gone M, few granules D-Con concentrate). Patient died at 30 hr. 26 yr old male, committed suicide, CA Coma, myoclonus, pinpoint pupils, cardiac arrhythmias, progressive hypotension, oliguria. Death after episodes of asystole. Congested, edematous lungs, denuded duodenal mucosa with recent hemorrhage, diffuse mild liver necrosis. HPLC; GC
BLOOD PLASMA; BILE; BRAIN; CEREBROSPINAL FLUID; BLOOD; LIVER; PANCREAS; HEART; DIAPHRAGM; KIDNEYS; DELIBERATE EXPOSURE; CALIFORNIA; SUICIDE; CASE HISTORIES; AUTOPSIES; HERBICIDES; PESTICIDES; INSECTICIDES; ORGANOPHOSPHATES				
Osterloh, J.; Lotti, M.; Pond, S.M. 1985 Journal of Analytical Toxicology 7:125-129				

Tissue	Cases Exposure Route	Range	Mean	General Information
8710 Urine	a) 15 b) 13 Inhalation	a) 0.06-9.51 ppm b) 0.40-1.92 ppm	a) 1.37 ppm b) 0.71 ppm	a) Involved in formulation: crew and project engineer b) Involved in application: pilot, flagmen, mixer, and supervisors. Combination and modification of various methods satisfactory for detection of 0.03 mg/L. Healthy 23-47 yr olds GC
URINE; OCCUPATIONAL EXPOSURE; MEASUREMENT METHODS; PESTICIDES; CROP DUSTING; PESTICIDE RESIDUES; INHALATION; BIOLOGICAL MONITORING				
Vural, N.; Burgaz, S. 1984 Bulletin of Environmental Contamination and Toxicology 33:518-524				

Tissue	Cases Exposure Route	Range	Mean	General Information
8711 Urine	1 Ingestion	Not applicable	670 mg/L	Autopsy samples after unknown dose of Killex (a mixture of 100 g 2,4-D/L, 50 g mecoprop/L, 9 g dicamba/L). Death within approximately 5 hr. 61 yr old suicide victim with history of mental illness and chronic alcoholism Comatose, distress, low blood pressure, peculiar odor on breath, heavy breathing, distended aldomen, vomiting Elevated white cell count. At autopsy, large volume of blood in pleural cavity HPLC
DELIBERATE EXPOSURE; SUICIDE; AUTOPSIES; PESTICIDES; HERBICIDES; BLOOD; URINE; BILE; LIVER				
Fraser, A.D.; Isner, A.F.; Perry, R.A. 1984 Journal of Forensic Sciences 29(4):1237-1241				

Acetic acid, (2,4-dichlorophenoxy)-
94-75-7
C8-H6-Cl2-O3
MW 221.04, MP 138 C, BP 160 C at 0.4 mm Hg

Tissue	Cases Exposure Route	Range	Mean	General Information
8712 Urine	1 Ingestion	Not given	138.7 ug/g	1.6 hr Ingested 1200 mg/kg chlorophenoxy acetic acids (360 mL Dexol, 360 mL Weed-B-Gone M, few granules D-Con concentrate) Patient died at 30 hr. 26 yr old male, committed suicide, CA Coma, myoclonus, pinpoint pupils, cardiac arrhythmias, progressive hypotension, oliguria. Death after episodes of asystole. Congested, edematous lungs, denuded duodenal mucosa with recent hemorrhage, diffuse mild liver necrosis. HPLC; GC

BLOOD PLASMA; BILE; BRAIN; CEREBROSPINAL FLUID; BLOOD; LIVER; PANCREAS; HEART; DIAPHRAGM; KIDNEYS; DELIBERATE EXPOSURE; CALIFORNIA; SUICIDE; CASE HISTORIES; AUTOPSIES; HERBICIDES; PESTICIDES; INSECTICIDES; ORGANOPHOSPHATES
Osterloh, J.; Lotti, M.; Pond, S.M. 1983 Journal of Analytical Toxicology 7:128-129

Tissue	Cases Exposure Route	Range	Mean	General Information
8713 Urine				Review. General information, reported levels, sources of exposure, metabolites, and methods of analysis for: phthalate ester plasticizers, chlorophenoxy acid herbicides, chlorophenol biocides, p-nitrophenol, simple phenols, benzenediols, and toluene.

URINE; ENVIRONMENTAL EXPOSURE; OCCUPATIONAL EXPOSURE; DELIBERATE EXPOSURE; CONSUMER EXPOSURE; ADULTS; REVIEW; CARCINOMAS; POISONING; MEASUREMENT METHODS; PESTICIDES; INDUSTRIAL CHEMICALS; HERBICIDES; INSECTICIDES; FUNGICIDES; PENTACHLOROPHENOL; SOLVENTS; BENZENES; PHENOLS; INDUSTRIAL POLLUTION; TOLUENE; BLOOD; CARCINOGEN; METABOLISM; METABOLITES; WOOD PRESERVATIVES
Patiadi, A.J. 1983 Priority Toxic Pollutants in Human Urine: Their Occurrence and Analysis, Aug. 1983, 60 p

Tissue	Cases Exposure Route	Range	Mean	General Information
8714 Urine	a) 7 b) 5 c) 12 d) 8 e) 5 Dermal Inhalation	a) 0.27-32.74 mg/kg b) 0.63-12.35 mg/kg c) 0.04-8.15 mg/kg d) 0.15-5.45 mg/kg e) 0.44-5.07 mg/kg	a) 6.17 mg/kg b) 3.16 mg/kg c) 1.42 mg/kg d) 1.72 mg/kg e) 2.55 mg/kg	a) Spray gun, rights-of-way, Kapuskasing, 1979 b) Spray gun, rights-of-way, North Bay 1979 c) Spray gun, roadside, 4 locations, 1980 d) Spray gun, rights-of-way, 3 locations, 1980 e) Mist blower, rights-of-way, 1 location, 1980 Adult herbicide applicators performing spray operations in Ontario. Workers used improved safety precautions in 1980. GC

URINE; SKIN; LUNGS; OCCUPATIONAL EXPOSURE; CANADA; ADULTS; INDUSTRIAL HYGIENE; HERBICIDES; HEALTH HAZARDS; INHALATION; OCCUPATIONAL HAZARDS
Libich, S.; To, J.C.; Frank, R.; Sirons, G.J. 1984 American Industrial Hygiene Association Journal 45(1):56-62

Acetic acid, (2,4,5-trichlorophenoxy)-
93-76-5
C8-H5-Cl3-O3
MW 255.49, MP 153 C (crystals from benzene)

Tissue	Cases Exposure Route	Range	Mean	General Information
8715 Urine				Review. General information, reported levels, sources of exposure, metabolites, and methods of analysis for: phthalate ester plasticizers, chlorophenoxy acid herbicides, chlorophenol biocides, p-nitrophenol, simple phenols, benzenediols, and toluene.
URINE; ENVIRONMENTAL EXPOSURE; OCCUPATIONAL EXPOSURE; DELIBERATE EXPOSURE; CONSUMER EXPOSURE; ADULTS; REVIEW; CARCINOMAS; POISONING; MEASUREMENT METHODS; PESTICIDES; INDUSTRIAL CHEMICALS; HERBICIDES; INSECTICIDES; FUNGICIDES; PENTACHLOROPHENOL; SOLVENTS; BENZENES; PHENOLS; INDUSTRIAL POLLUTION; TOLUENE; BLOOD; CARCINOGEN; METABOLISM; METABOLITES; WOOD PRESERVATIVES Fatiadi, A.J. 1983 Priority Toxic Pollutants in Human Urine: Their Occurrence and Analysis, Aug. 1983, 60 p				

Acetic acid, thiodi- (8 Cl); Acetic acid, 2,2'-thiobis- (9 Cl)
123-93-3
C4-H6-O4-S
MW 150.15; MP 129 C

Tissue	Cases Exposure Route	Range	Mean	General Information
8716 Urine	a) 9 b) 7 c) 3 d) 6 e) 12	a) Not given b) Not given c) Not given d) Not given e) Not given	a) 120 umol/L b) 25 umol/L c) 4 umol/L d) 8 umol/L e) 5 umol/L Medians	a) 25-27 wk b) 28-30 wk c) 31-33 wk d) 34-36 wk e) 37- wk Gestational ages. High levels in most premature babies thought due to unusual metabolism, not vinyl chloride exposure. Preterm infants, London, England MS
URINE; UNITED KINGDOM; PREMATURE INFANTS; METABOLISM Pettit, B.R.; King, G.S.; Oberholzer, V.G.; Lynes, G.W.; Wilson, H.K. 1984 Lancet 2(8398):359				

Acetic acid, trichloro-
76-03-9
C2-H-Cl3-O2
MW 163.40, MP 57-58 C, BP 196-197 C

Tissue	Cases Exposure Route	Range	Mean	General Information
8717 Blood	6 Inhalation	a) Not given b) Not given	a) 1900 ug/l b) 190 ug/l	a) 24 hr after start of 6 hr exposure, 350 ppm methyl chloroform b) 48 hr after start of 6 hr exposure, 35 ppm methyl chloroform Metabolite of methyl chloroform 26-54 yr old (mean 43) healthy volunteers GC

(next page)

Acetic acid, trichloro-
76-03-9
C2-H-Cl3-O2
MW 163.40, MP 57-58 C, BP 196-197 C

(continued)

Tissue	Cases Exposure Route	Range	Mean	General Information
8718 Urine	6 Inhalation	a) 200-48 ug/hr b) 25-2.8 ug/hr	a) Not given b) Not given	a) 30 hr and 9 d after start of 6 hr exposure, 350 ppm methyl chloroform b) 40 hr and 9 d after start of 6 hr exposure, 35 ppm methyl chloroform Total excreted was 24.4 mg (350 ppm) and 3.2 mg (35 ppm). Metabolite of methyl chloroform. 26-54 yr old (mean 43) healthy volunteers GC
BLOOD; DELIBERATE EXPOSURE; ADULTS; FUMES; INHALATION Nolan, R.J.; Freshour, N.L.; Rick, D.L.; McCarty, L.P.; Saunders, J.H. 1984 Fundamental and Applied Toxicology 4:654-662				

Acetone (8 CI); 2-Propanone (9 CI)
67-64-1
C3-H6-O
MW 58.08, MP -94.6 C, BP 56.48 C, VP 400 mm Hg at 39.5 C

Tissue	Cases Exposure Route	Range	Mean	General Information
8719 Blood	8	6-62 mg/dL	Not given	Autopsies. Deaths not related to isopropanol exposure. 5 cases were diabetic or alcoholic, 2 were severly dehydrated, and 1 had fatal heart attack. GC
8720 Brain	7	6-35 mg/100g	Not given	Autopsies. Deaths not related to isopropanol exposure. 5 cases were diabetic or alcoholic, 2 were severly dehydrated, and 1 had fatal heart attack. GC
8721 Kidney	8	1-30 mg/100 g	Not given	Autopsies. Deaths not related to isopropanol exposure. 5 cases were diabetic or alcoholic, 2 were severly dehydrated, and 1 had fatal heart attack. GC
8722 Liver	8	1-11 mg/100 g	Not given	Autopsies. Deaths not related to isopropanol exposure. 5 cases were diabetic or alcoholic, 2 were severly dehydrated, and 1 had fatal heart attack. GC
BLOOD; BRAIN; LIVER; KIDNEYS; AUTOPSIES; ALCOHOLS Davis, P.L.; Dal Cortivo, L.A.; Maturo, J. 1984 Journal of Analytical Toxicology 8:209-212				

alpha-Amanitin
23109-05-9
C39-H54-N10-O13-S
MW 903.00, MP 254-255 C

Tissue	Cases Exposure Route	Range	Mean	General Information
8723 Blood, serum	1 Ingestion	Not given	16.5 ng/ml	24 hr after ingestion of mushrooms, Amanita phalloides. 21 yr old, 8th mo pregnancy, Italy Nausea, vomiting, severe abdominal pain and diarrhea 10 hr after A. phalloides. No amitoxians in amniotic fluids. No evidence of hepatocellular damage to baby 2 mo later HPLC
CONSUMER EXPOSURE; DELIBERATE EXPOSURE; ACCIDENTAL POISONING; PREGNANCY; ITALY; ADULTS; NEWBORN; AMNIOTIC FLUID; BLOOD SERUM				
Belliardo, F.; Massano, G.; Accomo, S. 1982 The Lancet 1(8288):1381				

Aluminum
7429-90-5
Al
AtW 26.98154, MP 660 C, BP 2327 C, VP 1 mm Hg at 1540 C

Tissue	Cases Exposure Route	Range	Mean	General Information
8724 Aorta	a) 3 b) 6 c) 7	a) 28-75 ppm Dry wt b) 5.2-40 ppm Dry wt c) Not given	a) Not given b) Not given c) 16+/-6.4 ppm Dry wt	a) Sclerotic aorta from metal-workers b) Normal aorta from metal-workers c) Normal aorta from non metal-workers. 45-66 yr old workers. Autopsies, Japan, 1976-1977. Employed 7-32 yr ES
AORTA; VERTEBRAE; BONES; ENVIRONMENTAL EXPOSURE; OCCUPATIONAL EXPOSURE; JAPAN; AUTOPSIES; CADAVERS; CARDIOVASCULAR DISEASES; MINERALS; BIOACCUMULATION; DIETS; FOODS; MINERAL DEPOSITS; CALCIUM; PHOSPHORUS; IRON; MAGNESIUM; ZINC; ALUMINUM; COPPER; CADMIUM; LEAD; NICKEL; VANADIUM; CHROMIUM; MANGANESE; SILICON; TIN; TITANIUM; STRONTIUM				
Terasoka, H. 1984 Archives of Environmental Contamination and Toxicology 13:119-127				

Tissue	Cases Exposure Route	Range	Mean	General Information
8725 Blood	a) 4 b) 10	a) 40-1250 ug/l b) Not given	a) 5.62 ug/l b) 12.1+/-1.5 ug/l	a) Dialysis patients b) Healthy subjects 37-62 yr old dialysis patients with osteomalacia. Treated 0-96 mo. AAS
ALUMINUM; BLOOD SERUM; BLOOD; LIVER; IRON; BONE; DRUGS				
Verbueken, A.H.; Van de Vyver, F.L.; Van Grieken, R.E.; Paulus, G.J.; Visser, W.J.; D'Haese, P.; De Broe, M.E. 1984 Clinical Chemistry 30(5):763-766				

Aluminum
7429-90-5
Al
AtW 26.98154, MP 660 C, BP 2327 C, VP 1 mm Hg at 1540 C

Tissue	Cases Exposure Route	Range	Mean	General Information
6726 Blood	a) 98 b) 78 c) 10	a) Undetectable-165 ug/l b) Undetectable-15 ug/l c) 40-550 ug/l	a) Not given b) Not given c) Not given	a) 4 groups of Al-workers, exposed in various industrial processes b) 4 unexposed groups, matched by geographical areas to a) c) Dialysis patients Values estimated from figure. Group levels in a) significantly higher than in b) for 3 of the groups, although only 6 individuals in a) had levels >20 ug/ml. Adults, Sweden AAS
BLOOD; URINE; ENVIRONMENTAL EXPOSURE; OCCUPATIONAL EXPOSURE; SWEDEN; HEMODIALYSIS; ALUMINUM; HEALTH HAZARDS; INDUSTRIAL ATMOSPHERES; INDUSTRIES; OCCUPATIONAL HAZARDS Sjogren, B.; Lundberg, I.; Lidums, V. 1985 British Journal of Industrial Medicine 42:301-304				

Tissue	Cases Exposure Route	Range	Mean	General Information
6727 Blood	1 Ingestion	Not given	0.1 ug/mL	Post mortem after unknown quantity Al phosphide (Phostoxin) tablets. 27-yr old poisoning victim AAS
BLOOD; LIVER; STOMACH; URINE; DELIBERATE EXPOSURE; AUTOPSIES; CADAVERS; CASE HISTORIES; ALUMINUM Chan, L.T.F.; Dellion, C.D.; Geyer, R. 1983 Journal of Analytical Toxicology 7:165-167				

Tissue	Cases Exposure Route	Range	Mean	General Information
6726 Blood, plasma	17	a) 8.8-12.5 ug/l b) <0.5-20.1 ug/l c) 1-36.9 ug/l	a) 6.6+/-2.6 ug/l b) 4.17 ug/l c) 6.14 ug/l	a) 10 controls b) 7 workers, beginning of workshift c) End of workshift Exposed subjects - welders, cutters, polishers. Levels essentially same as in controls with the exception of 2 determinations. Not a useful indicator of exposure under these conditions. Occupational exposures for 6 mo to environmental levels below or equal to TWA, 5 mg/cu m. Unexposed, healthy controls. AAS; GC
BLOOD PLASMA; URINE; ALUMINUM; OCCUPATIONAL EXPOSURE; DUST; INDUSTRIAL PLANTS; FUMES Mussi, I.; Calzaferri, G.; Burrati, M.; Alessio, L. 1984 International Archives of Occupational and Environmental Health 5:155-161				

Aluminum
7429-90-5
Al
AtW 26.98154, MP 660 C, BP 2327 C, VP 1 mm Hg at 1549 C

Tissue	Cases Exposure Route	Range	Mean	General Information
87: 0 Blood, plasma	a) 32 b) 55 c) 80	a) Not given b) Not given c) Not given	a) 0.192+/-0.021 ug/mL b) 0.204+/-0.033 ug/mL c) 0.194+/-0.025	a) Insulin-treated diabetics b) Non-insulin-treated diabetics c) Control non-diabetics Collected after overnight fasting. Significant difference between a) and b). 18-78 yr olds, Oxford, England NA; AAS

BLOOD PLASMA; ENGLAND; DIABETES; METABOLISM; MINERAL METABOLISM; ALUMINUM; ANTIMONY; ARSENIC; BARIUM; BROMINE; CADMIUM; CALCIUM; CESIUM; CHROMIUM; COBALT; COPPER; IODINE; IRON; LEAD; MAGNESIUM; MANGANESE; MERCURY; MOLYBDENUM; NICKEL; RUBIDIUM; SCANDIUM; SELENIUM; SILVER; TIN; VANADIUM; ZINC
Ward, N.I.; Pim, B. 1984 Biological Trace Element Research 6:469-487

Tissue	Cases Exposure Route	Range	Mean	General Information
6730 Blood, serum	a) 24 b) 33 c) 26 d) 16 e) 119 f) 64	a) 19-47 ug/L b) 21-44 ug/L c) 8-34 ug/L d) 20-46 ug/L e) 3-37 ug/L f) 3-21 ug/L	a) 32.2+/-8.3 ug/L b) 29.3+/-5.8 ug/L c) 17.0+/-6.9 ug/L d) 33.2+/-8.9 ug/L e) 12.4+/-6.5 ug/L f) 9.5+/-4.3 ug/L	a) Nonindustrially exposed 28-66 yr olds, mean age 48 b) Zn/Mn deficiency, 19-70 yr olds, mean age 41 c) Children, hyperactive or learning disabled, 3-15 yr olds, mean age 9.1 d) Adults, memory disturbances, depressed and nondepressed, 41-75 yr olds, mean age 59 e) Normals, 18-76 yr olds, mean age, 39 f) Normals, 3-16 yr olds, mean age, 11.3

BLOOD SERUM; UNITED KINGDOM; ADULTS; CHILDREN; DEPRESSION; LEARNING DISABILITIES; NUTRITIONAL DEFICIENCIES; MEASUREMENT METHODS; ALUMINUM; ENVIRONMENTAL EXPOSURE
Howard, J.M.H. 1984 Clinical Chemistry 30(10):1722-1725

Tissue	Cases Exposure Route	Range	Mean	General Information
6731 Bone	1	Not given	<15 ppm Dry wt	Lumbar vertebrae (n=5). Chromate plating worker, employed 7 yr, died at age 66, 30 yr after changing jobs ES

AORTA; VERTEBRAE; BONES; ENVIRONMENTAL EXPOSURE; OCCUPATIONAL EXPOSURE; JAPAN; AUTOPSIES; CADAVERS; CARDIOVASCULAR DISEASES; MINERALS; BIOACCUMULATION; DIETS; FOODS; MINERAL DEPOSITS; CALCIUM; PHOSPHORUS; IRON; MAGNESIUM; ZINC; ALUMINUM; COPPER; CADMIUM; LEAD; NICKEL; VANADIUM; CHROMIUM; MANGANESE; SILICON; TIN; TITANIUM; STRONTIUM
Tsuchs, H. 1984 Archives of Environmental Contamination and Toxicology 13:119-127

Aluminum

7429-90-5
Al
AtW 26.98154, MP 660 C, BP 2327 C, VP 1 mm Hg at 1540 C

Tissue	Cases Exposure Route	Range	Mean	General Information
8782 Cerebrospinal fluid	a) 10 b) 6 c) 3 d) 6 e) 3 f) 1	a) Not given b) Not given c) Not given d) Not given e) Not given f) Not given	a) 326.6+/-171.3 ug/l b) 315+/-200 ug/l c) 452+/-208 ug/l d) 361+/-164 ug/l e) 420+/-168 ug/l f) 230 ug/l	a) Controls, non-neoplastic diseases (hydrocephalus, etc.) b) Meningioma c) Craniopharyngioma d) Astrocytoma e) Medulloblastoma f) Chondrosarcoma b, c) Benign brain tumors, (d-f) malignant brain tumors No significant differences. Patients, 18 men, 14 women, range of mean ages 4.6-55.0 yr, fasted 8-12 hr AAS
CEREBROSPINAL FLUID; SAUDI ARABIA; CARCINOMAS; NEOPLASMS; SARCOMAS; ALUMINUM; ANTIMONY; BISMUTH; CADMIUM; COPPER; GOLD; LEAD; SELENIUM; SILVER				
El-Yazigi, A.; Al-Saleh, I.; Al-Mefty, O. 1984 Clinical Chemistry 30:1358-1360				

Tissue	Cases Exposure Route	Range	Mean	General Information
8788 Liver	1 Ingestion	Not given	0.5 ug/g	Post mortem after unknown quantity Al phosphide (Phostoxin) tablets. 27-yr old poisoning victim AAS
BLOOD; LIVER; STOMACH; URINE; DELIBERATE EXPOSURE; AUTOPSIES; CADAVERS; CASE HISTORIES; ALUMINUM				
Chan, L.T.F.; Dellieu, C.D.; Geyer, R. 1983 Journal of Analytical Toxicology 7:165-167				

Tissue	Cases Exposure Route	Range	Mean	General Information
8784 Liver	36	a) 0.2-31.6 ug/g b) -/<0.3-33.1 ug/g	a) 2.15 ug/g b) -/<2.16 ug/g	a) 1 sample per liver, most values <1.0 ug/g, single value of 31.6 ug/g, AAS b) 1 sample from 16 livers, 2 samples from 20, NA, most values <1.0 ug/g Normal tissue from autopsies. Baltimore, MD, Minneapolis, MN; Seattle, WA AAS; NA
LIVER; ENVIRONMENTAL EXPOSURE; AUTOPSIES; COMPARATIVE EVALUATIONS; MEASUREMENT METHODS; ALUMINUM; CADMIUM; COPPER; LEAD; MANGANESE; SELENIUM; ZINC				
Seisler, R.; Harrison, S.H.; Wise, S.A. 1984 Biological Trace Element Research 6:31-40				

Aluminum
7429-90-5
Al
AtW 26.98154, MP 660 C, BP 2327 C, VP 1 mm Hg at 1540 C

Tissue	Cases Exposure Route	Range	Mean	General Information
8735 Stomach	1 Ingestion	Not given	800 ug/g	Post mortem after unknown quantity Al phosphide (Phostoxin) tablets in stomach and contents. 27-yr old poisoning victim AAS
BLOOD; LIVER; STOMACH; URINE; DELIBERATE EXPOSURE; AUTOPSIES; CADAVERS; CASE HISTORIES; ALUMINUM Chan, L.T.F.; Dellion, C.D.; Geyer, R. 1983 Journal of Analytical Toxicology 7:165-167				

Tissue	Cases Exposure Route	Range	Mean	General Information
8736 Urine	17	a) 2.1-13.3 ug/l b) 12-101 ug/l c) 15-252 ug/l d) 7-13 ug/l	a) 4.6+/-3.5 ug/l b) 46.2 ug/l c) 92.7 ug/l d) 9 ug/l	a) 10 controls b) 7 workers, start of shift c) End of workshift d) After 2 wk away from work Subjects were welders, cutters, polishers - levels highest in those exposed to fumes. Occupational exposures for 6 mo to environmental levels below or equal to TWA, 5 mg/cu m. Unexposed, healthy controls. AAS; GC
BLOOD PLASMA; URINE; ALUMINUM; OCCUPATIONAL EXPOSURE; DUST; INDUSTRIAL PLANTS; FUMES Mussi, I.; Calzaferri, G.; Burrati, M.; Alessio, L. 1984 International Archives of Occupational and Environmental Health 5:155-161				

Tissue	Cases Exposure Route	Range	Mean	General Information
8737 Urine	a) 93 b) 78 c) 19	a) Undetectable-4280 ug/l b) Undetectable-55 ug/l c) 25-440 ug/l	a) Not given b) 4 ug/l c) Not given Median	a) 4 groups of Al-workers, exposed in various industrial processes b) 4 unexposed groups, matched by geographical areas to a) c) Dialysis patients Values estimated from figure. Exposure time of Al-welders related to levels adjusted to creatine. Adults, Sweden AAS
BLOOD; URINE; ENVIRONMENTAL EXPOSURE; OCCUPATIONAL EXPOSURE; SWEDEN; HEMODIALYSIS; ALUMINUM; HEALTH HAZARDS; INDUSTRIAL ATMOSPHERES; INDUSTRIES; OCCUPATIONAL HAZARDS Sjogren, B.; Lundberg, I.; Lidums, V. 1983 British Journal of Industrial Medicine 40:301-304				

Tissue	Cases Exposure Route	Range	Mean	General Information
8738 Urine	1 Ingestion	Not given	0.6 ug/mL	Post mortem after unknown quantity Al phosphide (Phostoxin) tablets. 27-yr old poisoning victim AAS
BLOOD; LIVER; STOMACH; URINE; DELIBERATE EXPOSURE; AUTOPSIES; CADAVERS; CASE HISTORIES; ALUMINUM Chan, L.T.F.; Dellion, C.D.; Geyer, R. 1983 Journal of Analytical Toxicology 7:165-167				

Aluminum
7429-90-5
Al
AtW 26.98154, MP 660 C, BP 2327 C, VP 1 mm Hg at 1540 C

Tissue	Cases Exposure Route	Range	Mean	General Information
8730 Urine	8 Ingestion	a) Not given b) Not given c) Not given d) Not given	a) 120+/-22 ug/day b) 105+/-16 ug/day c) 36+/-4 ug/day d) 35+/-5 ug/day	a) 125 mg/day, days 7-12 b) 125 mg/day, days 13-18 c) 5 mg/day, days 7-12 d) 5 mg/day, days 13-18. Healthy 25+/-3 yr olds, mean ht 176+/-8 cm, mean wt 70+/-9 kg AAS
DELIBERATE EXPOSURE; BIOACCUMULATION; METABOLISM; URINE; ALUMINUM; WISCONSIN; ADULTS; BLOOD SERUM; DRUGS Greger, J.L.; Baier, M.J. 1983 Food and Chemical Toxicology 21(4):473-477				

Ammonium
14798-03-9
H4-N

Tissue	Cases Exposure Route	Range	Mean	General Information
8740 Blood, plasma	50	a) Not given b) Not given c) Not given d) Not given e) Not given	a) 35.3+/-0.6 umol/L b) 52.0+/- 2.0 umol/L c) 44.3+/-1.3 umol/L d) 33.4+/-1.2 e) 45.5+/-2.0 umol/L	a) 26 Normoammonemic 1 wk-2 mo old b) 17 hyperammonemic, 1-2 wk old, prior to arginine supplement c) 16 hyperammonemic 1-2 wk old, controls d) 17, 2-8 wk old, 1-2 mmol arginine/kg/d for 6-8 wk e) 16, 2-8 wk old, no arginine therapy Significant differences: a) from b) and c) ($p<0.001$), b) and d), ($p<0.001$) 1-8 wk old premature infants (gestational age <37 wk), Johns Hopkins Hospital, Baltimore, MD Cation exchange resin
BLOOD PLASMA; MARYLAND; PREMATURE INFANTS; AMMONIUM COMPOUNDS Batshaw, M.L.; Wachtel, R.C.; Thomas, G.H.; Starrett, A.; Brusilow, S.W. 1984 Journal of Pediatrics 105(1):86-91				

Antimony
7440-36-0
Sb
AtW 121.75, MP 630 C, BP 1635 C, VP 1 mm Hg at 886 C, 10 mm Hg at 960 C

Tissue	Cases Exposure Route	Range	Mean	General Information
8741 Blood, plasma		a) Not given b) Not given c) Not given	a) 0.0027+/-0.0007 ug/mL b) 0.0031+/-0.0009 ug/mL c) 0.0025+/-0.0006 ug/mL	a) Insulin-treated diabetics b) Non-insulin-treated diabetics c) Control non-diabetics Collected after overnight fasting. Significant difference between b), c), and a), b). 16-78 yr olds, Oxford, England NA; AAS
BLOOD PLASMA; ENGLAND; DIABETES; METABOLISM; MINERAL METABOLISM; ALUMINUM; ANTIMONY; ARSENIC; BARIUM; BROMINE; CADMIUM; CALCIUM; CESIUM; CHROMIUM; COBALT; COPPER; IODINE; IRON; LEAD; MAGNESIUM; MANGANESE; MERCURY; MOLYBDENUM; NICKEL; RUBIDIUM; SCANDIUM; SELENIUM; SILVER; TIN; VANADIUM; ZINC Ward, N.I.; Pim, B. 1984 Biological Trace Element Research 6:469-487				

Antimony
7440-36-0
Sb
AtW 121.75, MP 630 C, BP 1635 C, VP 1 mm Hg at 886 C, 10 mm Hg at 960 C

Tissue	Cases Exposure Route	Range	Mean	General Information
8742 Cerebrospinal fluid	a) 10 b) 8 c) 3 d) 6 e) 3 f) 1	a) Not given b) Not given c) Not given d) Not given e) Not given f) Not given	a) 20.9+/-8.8 ug/l b) 20.8+/-5.2 ug/l c) 25.8+/-14.6 ug/l d) 22.2+/-8.2 ug/l e) 45.5+/-14.5 ug/l f) 28.3 ug/l	a) Controls, non-neoplasmic diseases (hydrocephalus, etc.) b) Meningioma c) Craniopharyngioma d) Astrocytoma e) Medulloblastoma f) Pinealblastoma g) Chondrosarcoma b, c) Benign brain tumors, (d-g) malignant brain tumors Significant differences between malignant tumor and control groups ($p<0.047$), and between malignant and benign tumor groups ($p<0.014$). Relationship, if any, to malignancy unknown. Patients, 18 men, 14 women, range of mean ages 4.6-55.0 yr, fasted 8-12 hr AAS
CEREBROSPINAL FLUID; SAUDI ARABIA; CARCINOMAS; NEOPLASMS; SARCOMAS; ALUMINUM; ANTIMONY; BISMUTH; CADMIUM; COPPER; GOLD; LEAD; SELENIUM; SILVER El-Yazigi, A.; Al-Saleh, I.; Al-Mefty, O. 1984 Clinical Chemistry 30:1358-1360				

Tissue	Cases Exposure Route	Range	Mean	General Information
8743 Milk	a) 10 b) 16 c) 4	a) 0.1-1.0 ug/kg b) 0.12-3.0 ug/kg c) 0.40-3.2 ug/kg Dry wt	a) 0.5 +or- 0.3 ug/kg b) 0.55 +or- 0.67 ug/kg c) 1.2 +or- 1.3 ug/kg Dry wt	a) Colostrum (1st or 2nd day post partum) b) Transitional milk (3-8 days post partum) c) Mature milk (1-8 mo post partum) Slovenia, Yugoslavia NA
MILK; ARSENIC; CADMIUM; COBALT; COPPER; MERCURY; IODINE; MANGANESE; ANTIMONY; SELENIUM; VANADIUM; ZINC; YUGOSLAVIA; ENVIRONMENTAL EXPOSURE Kosta, L.; Byrne, A.R.; Dermelj, M. 1985 Science of the Total Environment 29:261-268				

Arochlor 1242 (No postings in CHEMLINE).
53469-21-9
EXACT COMPOSITION UNKNOWN OR UNDETERMINED

Tissue	Cases Exposure Route	Range	Mean	General Information
8744 Blood, serum	174	a) 12-392 ppb b) Not given c) Not given	a) Not given b) 1195+/-225 ppb c) 774 ppb	a) 173 capacitor workers b) 1 person, before fat-free diet and exercise program c) After fat-free diet Fasting blood samples. Equations derived for predicting body burden based on total body fat, serum PCB, and serum lipids. Drop in level in c) supports prediction. 1979. One with familial hyperlipidemia.
ADIPOSE TISSUE; BLOOD SERUM; OCCUPATIONAL EXPOSURE; MEASUREMENT METHODS; POLYCHLORINATED BIPHENYLS; BIOACCUMULATION Brown, J.F.Jr.; Lawton, R.W. 1984 Bulletin of Environmental Contamination and Toxicology 33:277-280				

Arsenic
7440-38-2
As
AtW 74.9216, MP 817 C at 28 atm, BP 613 C (sublimes), VP 1 mm Hg at 380 C, 10 mm Hg at 440 C

Tissue	Cases Exposure Route	Range	Mean	General Information
8752 Adrenal gland	19	a) Not given b) Not given	a) 194 +or- 140 ng/g b) 475 +or- 479 ng/g Wet wt	a) Men b) Women Autopsies, normal tissues. In decreasing order of % of total: As(V), As(III), methylated compounds 36-79 yr olds, unknown exposure, Japan. AAS
8753 Aorta	16	a) Not given b) Not given	a) 469 +or 131 ng/g b) 633 +or- 480 ng/g Wet wt	a) Men b) Women Autopsies, normal tissues. In decreasing order of % of total: As(V), As(III), methylated compounds 36-79 yr olds, no known exposure, Japan. AAS

JAPAN; AUTOPSIES; CADAVERS; AORTA; ADRENAL GLANDS; CEREBELLUM; CEREBRUM; KIDNEYS; LIVER; LUNGS; MUSCLES; PANCREAS; SKIN; SPLEEN; ARSENIC
Yamauchi, H.; Yamamura, Y. 1983 Bulletin of Environmental Contamination and Toxicology 31:267-277

Tissue	Cases Exposure Route	Range	Mean	General Information
8754 Blood	189 Inhalation Ingestion Dermal	a) 0.5-32 ug/l b) 10-450 ug/l c) 8-48 ug/l d) 0.5-38 ug/l e) 0.5-37 ug/l	a) 5.1+/-6.9 ug/l b) Not given c) 30.7+/-16.8 ug/l d) 12.5+/-10.5 ug/l e) 13.4+/-15 ug/l	a) Reference population, 148 subjects b) 1 subject, 3 & 36 d after ingesting approx 3 g As2O3, peak on day 3 c) Glass mix makers, air levels As2O3=4.5-610 ug/cu m d) Glass blowers & casters, air levels=0.6-2.9 ug/cu m e) Storers & clerks, indirect exposures Levels correlated with urinary levels Healthy males, mean age 33 yr, 36% nonsmokers, no occupational exposure. 18 yr old, attempted suicide. 42 yr old glass factory workers, employed 18+/-9 yr, exposure intensity varied with task. In case of acute poisoning: diarrhea & vomiting 2 hr after ingestion AAS

ARSENIC; OCCUPATIONAL EXPOSURE; BLOOD; URINE; SUICIDE; DELIBERATE EXPOSURE; BIOLOGICAL MONITORING; ITALY
Foa, V.; Colombi, A.; Maroni, M.; Buratti, M.; Calzaferri, G. 1984 Science of the Total Environment 34:241-259

Tissue	Cases Exposure Route	Range	Mean	General Information
8755 Blood	1 Ingestion	Not applicable	1.6 ppm	Subject admitted to hospital emergency room 2 days after initial complaint. Suffered respiratory arrest, was resuscitated, then died. Normal range 0.2-0.4 ppm. 27 yr old father in farm family exposed thru drinking water Shortness of breath, pain on swallowing, tremulousness, syncope, gross hematuria, shock, respiratory arrest, seizure, coma, death Modified Gutzeit

URINE; BLOOD; LIVER; CONSUMER EXPOSURE; ENVIRONMENTAL EXPOSURE; VIRGINIA; AUTOPSIES; CASE HISTORIES; ARSENIC; METALS; ACCIDENTAL POISONING; WATER POLLUTION; DRINKING WATER; FARMS; PESTICIDES
Armstrong, C.W.; Stroube, R.B.; Rubio, T.; Siudyla, E.A.; Miller, G.B. 1984 Archives of Environmental Health 39(4):276-279

Arsenic
7440-38-2
As
AtW 74.9216, MP 817 C at 26 atm, BP 613 C (sublimes), VP 1 mm Hg at 380 C, 10 mm Hg at 440 C

Tissue	Cases Exposure Route	Range	Mean	General Information
8756 Blood	a) About 100 b) About 50 Ingestion	a) Not given b) Not given	a) 0.008+/-0.005 ug/ml b) 0.002+/-0.001 ug/ml	a) Exposed individuals. 0.41 mg/l in drinking water b) Non-exposed individuals. 0.005 mg/l in drinking water Levels in a) unrelated to length of exposure. Comparable groups with and without cutaneous poisoning signs, of inhabitants of a town with high arsenic content in the drinking water. Control group. Mexico AAS

BLOOD; HAIR; NAILS; URINE; CONSUMER EXPOSURE; MEXICO; COMPARATIVE EVALUATIONS; ARSENIC; DRINKING WATER; POPULATION EXPOSURE
Olguin, A.; Jauge, P.; Cebrian, M.; Albores, A. 1983 Proceedings of the Western Pharmacology Society 26:175-177

Tissue	Cases Exposure Route	Range	Mean	General Information
8757 Blood, plasma		a) Not given b) Not given c) Not given	a) 0.018+/-0.004 ug/mL b) 0.200+/-0.005 ug/mL c) 0.015+/-0.004	a) Insulin-treated diabetics b) Non-insulin-treated diabetics c) Control non-diabetics Collected after overnight fasting. Significant difference among all groups. 18-78 yr olds, Oxford, England NA; AAS

BLOOD PLASMA; ENGLAND; DIABETES; METABOLISM; MINERAL METABOLISM; ALUMINUM; ANTIMONY; ARSENIC; BARIUM; BROMINE; CADMIUM; CALCIUM; CESIUM; CHROMIUM; COBALT; COPPER; IODINE; IRON; LEAD; MAGNESIUM; MANGANESE; MERCURY; MOLYBDENUM; NICKEL; RUBIDIUM; SCANDIUM; SELENIUM; SILVER; TIN; VANADIUM; ZINC
Ward, N.I.; Pim, B. 1984 Biological Trace Element Research 6:469-487

Tissue	Cases Exposure Route	Range	Mean	General Information
8758 Bone	2 Ingestion	a) Not given b) Not given	a) 183 ug/g b) 1.6 ug/g	a) Rib core. Female, death from acute As overdose, exhumation 3 wk after death b) Sternum. Male, death from unknown causes, exhumation 7 mo after death. Autopsies, 44 yr old female, 9 yr old male Cutneit

NAILS; BONES; HAIR; KIDNEYS; LIVER; SPINAL CORD; MUSCLES; DELIBERATE EXPOSURE; ARSENIC; AUTOPSIES; CADAVERS; MEASUREMENT METHODS
Piri, J.N.; Townsend, G.F.; Valaitis, A.K.; Grohlich, D.; Spikes, J.J. 1983 Journal of Analytical Toxicology 7:216-219

Arsenic
7440-38-2
As
AtW 74.9216, MP 817 C at 28 atm, BP 613 C (sublimes), VP 1 mm Hg at 380 C, 10 mm Hg at 440 C

Tissue	Cases Exposure Route	Range	Mean	General Information
8759 Breast	22	a) Not given b) Not given	a) 0.10+/-0.13 ug/g b) 0.13+/-0.09 ug/g	a) Normal tissue b) Neoplastic Dry wt, 3 samples, p=0.04 Patients with primary breast carcinoma, samples of normal and neoplastic tissue obtained at time of mastectomy X-ray fluorescence
BREAST; CALCIUM; VANADIUM; CHROMIUM; MANGANESE; IRON; NICKEL; COPPER; ZINC; ARSENIC; SELENIUM; BROMINE; RUBIDIUM; STRONTIUM; MOLYBDENUM; LEAD; MERCURY; NEOPLASMS Rizk, S.L.; Sky-Peck, H.H. 1984 Cancer Research 44:5390-5394				

Tissue	Cases Exposure Route	Range	Mean	General Information
8760 Cerebellum	30	a) Not given b) Not given	a) 128 +or- 71.9 ng/g b) 138 +or- 41.5 ng/g Wet wt	a) Men b) Women Autopsies, normal tissues. In decreasing order of % of total: As(V), As(III), methylated compounds 36-79 yr olds, no known exposure, Japan. AAS
8761 Cerebrum	30	a) Not given b) Not given	a) 77.3 +or- 40.0 ng/g b) 75.3 +or- 39.1 ng/g Wet wt	a) Men b) Women Autopsies, normal tissues. In decreasing order of % of total: As(V), As(III), methylated compounds 36-79 yr olds, unknown exposure, Japan. AAS
JAPAN; AUTOPSIES; CADAVERS; AORTA; ADRENAL GLANDS; CEREBELLUM; CEREBRUM; KIDNEYS; LIVER; LUNGS; MUSCLES; PANCREAS; SKIN; SPLEEN; ARSENIC Yamauchi, H.; Yamamura, Y. 1983 Bulletin of Environmental Contamination and Toxicology 31:267-277				

Arsenic
7440-38-2
As
AtW 74.9216, MP 817 C at 28 atm, BP 613 C (sublimes), VP 1 mm Hg at 380 C, 10 mm Hg at 440 C

Tissue	Cases Exposure Route	Range	Mean	General Information
8762 Hair	a) 1 b) 1 c) 1 d) 1 e) 1 f) 1 Inhalation Ingestion Dermal	a) Not given b) Not given c) Not given d) 0.5-4.7 ppm e) 0.39-1.2 ppm f) 0.17-2.2 ppm	a) 87 ppm b) 17.4 ppm c) 0.3 ppm d) Not given e) Not given f) Not given	a) 30 yr old father, unwashed sample b) 30 yr old mother, sample from hairbrush (proximal, middle, distal cuttings, levels were 12.15, 1.59, 0.49 ppm) c) 9.5 yr old d) 8 yr old e) 7 yr old f) 5.5 yr old Samples from family at initial visit to clinic. Normal levels <0.65 ppm. None detected in urine. Rural WI family of 8, ages 1-30 yr, chronic exposure from burning treated wood (ashes in area >1000 ppm, nearby 100-600 ppm. Air 0.300 ug/cu m). Some living area/kitchen measurements made in summer. Cr, Cu, As may have contributed to problems involving eyes, respiratory system (severe irritation, pneumonic problems), CNS (sensation loss, disorientation, seizures, blackouts, headaches), GI (diarrhea), blood, reproductive system, skin, liver (hepatitis) Muscle cramps, nosebleeds, bruises, sinusitis, dermatitis AAS
NAILS; HAIR; ARSENIC; ENVIRONMENTAL EXPOSURE; WISCONSIN Peters, H.A.; Croft, W.A.; Woolson, E.A.; Darcey, B.A.; Olson, M.A. 1984 Journal of the American Medical Association 251(18):2393-2396				

Tissue	Cases Exposure Route	Range	Mean	General Information
8763 Hair	10	0.1-0.4 ppm	0.23 ppm	Pottery workers No values given for controls Tlaquepaque and Tonala, Mexico NA
HAIR; OCCUPATIONAL EXPOSURE; ARIZONA; MEXICO; ADULTS; LEAD; CADMIUM; ARSENIC; VANADIUM; GOLD; ZINC; COPPER; IRON; MANGANESE; POTASSIUM Weber, C.W.; Nelson, G.W.; deVaquera, M.V.; Pearson, P.B. 1984 Nutrition Reports International 30(5):1009-1016				

Tissue	Cases Exposure Route	Range	Mean	General Information
8764 Hair	a) About 100 b) About 50 Ingestion	a) Not given b) Not given	a) 1.24+/-0.61 ug/g b) 0.06+/-0.02 ug/g	a) Exposed individuals. 0.41 mg/l in drinking water b) Non-exposed individuals. 0.005 mg/l in drinking water Levels in a) unrelated to length of exposure. Comparable groups with and without cutaneous poisoning signs, of inhabitants of a town with high arsenic content in the drinking water. Control group. Mexico Exposed individuals with cutaneous signs of chronic poisoning had significantly (about 35%) higher levels than those without such signs AAS
BLOOD; HAIR; NAILS; URINE; CONSUMER EXPOSURE; MEXICO; COMPARATIVE EVALUATIONS; ARSENIC; DRINKING WATER; POPULATION EXPOSURE Olguin, A.; Jauge, P.; Cebrian, M.; Albores, A. 1983 Proceedings of the Western Phamacology Society 26:175-177				

Arsenic
7440-38-2
As
AtW 74.9216, MP 817 C at 28 atm, BP 613 C (sublimes), VP 1 mm Hg at 380 C, 10 mm Hg at 440 C

Tissue	Cases Exposure Route	Range	Mean	General Information
8765 Hair	2 Inhalation Dermal	12-87 ppm	Not given	Chromate-copper-arsenic-treated wood burned in home Rural family Conjunctivitis, bronchitis, sensory hyperesthesia, muscle cramps, dermatitis, nosebleeds, ear infections, gastrointestinal disturbance, alopecia
ARSENIC; CHROMIUM; COPPER; AIR POLLUTION; HEALTH HAZARDS; ADOLESCENTS; ADULTS; CHILDREN; DERMATITIS; SKIN DISEASES; COMPARATIVE EVALUATIONS Peters, H.A.; Croft, W.A.; Woolson, E.A.; Darcey, B.A.; Olson, M.A. 1983 New England Journal of Medicine 308(22):1360-1361				

Tissue	Cases Exposure Route	Range	Mean	General Information
8766 Hair	5	Not detected-0.5 ug/g	Not given	Autopsy samples Alcohol cirrhosis patients, drank "home-made brew" containing 0.06-4.44 ug/ml As, India. NA
INDIA; AUTOPSIES; CIRRHOSIS; LIVER DISEASES; HAIR; LIVER; NAILS; ARSENIC; ALCOHOLIC BEVERAGES; BIOACCUMULATION Dhawan, D.; Narang, A.P.S.; Datta, D.V. 1983 Toxicology Letters 15:105-106				

Tissue	Cases Exposure Route	Range	Mean	General Information
8767 Hair	2 Ingestion	a) Not applicable b) Not applicable c) Not applicable	a) 16 ug/g b) 1.1 ug/g c) 0.1 ug/g	a) Head hair. Proximal, 0-3.2 cm b) Medial, 6.4-9.5 cm c) Distal, 12.1-15.2 cm. Autopsy. 9 yr old male, death from unknown causes, exhumation 7 mo after death. Gutzeit
NAILS; BONES; HAIR; KIDNEYS; LIVER; SPINAL CORD; MUSCLES; DELIBERATE EXPOSURE; ARSENIC; AUTOPSIES; CADAVERS; MEASUREMENT METHODS Pirl, J.N.; Townsend, G.F.; Valaitis, A.K.; Grohlich, D.; Spikes, J.J. 1983 Journal of Analytical Toxicology 7:216-219				

Tissue	Cases Exposure Route	Range	Mean	General Information
8768 Kidney	24	a) Not given b) Not given	a) 142 +or- 89.1 ng/g b) 94.8 +or- 21.4 ng/g Wet wt	a) Men b) Women Autopsies, normal tissues. In decreasing order of % of total: As(V), As(III), methylated compounds 36-79 yr olds, unknown exposure, Japan. AAS
JAPAN; AUTOPSIES; CADAVERS; AORTA; ADRENAL GLANDS; CEREBELLUM; CEREBRUM; KIDNEYS; LIVER; LUNGS; MUSCLES; PANCREAS; SKIN; SPLEEN; ARSENIC Yamauchi, H.; Yamamura, Y. 1983 Bulletin of Environmental Contamination and Toxicology 31:267-277				

Arsenic
7440-38-2
As
AtW 74.9216, MP 817 C at 28 atm, BP 613 C (sublimes), VP 1 mm Hg at 380 C, 10 mm Hg at 440 C

Tissue	Cases Exposure Route	Range	Mean	General Information
8769 Kidney	1 Ingestion	Not applicable	2.0 ug/g	Autopsy. 9 yr old male, death from unknown causes, exhumation 7 mo after death. Gutzeit
NAILS; BONES; HAIR; KIDNEYS; LIVER; SPINAL CORD; MUSCLES; DELIBERATE EXPOSURE; ARSENIC; AUTOPSIES; CADAVERS; MEASUREMENT METHODS Pirl, J.N.; Townsend, G.F.; Valaitis, A.K.; Grohlich, D.; Spikes, J.J. 1983 Journal of Analytical Toxicology 7:216-219				

Tissue	Cases Exposure Route	Range	Mean	General Information
8770 Liver	a) 89 b) 9 c) 14 d) 9	a) Not given b) Not given c) Not given d) Not given	a) 2+/-0.4 ug b) 26+/-4.5 ug c) 81+/-39 ug d) 56+/-14 ug /100g	a) Control b) Non-cirrhotic portal fibrosis c) Hepatitis B virus induced cirrhosis d) Amoebic liver abscess and fulminant hepatitis Autopsies. Authors concluded high levels not etiologically important India
LIVER; INDIA; LIVER DISEASES; ARSENIC; AUTOPSIES Koshy, A.; Narang, A.P.S.; Bhusnurmath, S.R. 1983 Toxicology Letters 19:201				

Tissue	Cases Exposure Route	Range	Mean	General Information
8771 Liver	1 Ingestion	Not applicable	86 ppm	Subject admitted to hospital emergency room 2 days after initial complaint. Suffered respiratory arrest, was resuscitated, then died. Normal range 0.00-0.3 ppm. 27 yr old father in farm family exposed thru drinking water Shortness of breath, pain on swallowing, tremulousness, syncope, gross hematuria, shock, respiratory arrest, seizure, coma, death Modified Gutzeit
URINE; BLOOD; LIVER; CONSUMER EXPOSURE; ENVIRONMENTAL EXPOSURE; VIRGINIA; AUTOPSIES; CASE HISTORIES; ARSENIC; METALS; ACCIDENTAL POISONING; WATER POLLUTION; DRINKING WATER; FARMS; PESTICIDES Armstrong, C.W.; Stroube, R.B.; Rubio, T.; Siudyla, E.A.; Miller, G.B. 1984 Archives of Environmental Health 39(4):276-279				

Tissue	Cases Exposure Route	Range	Mean	General Information
8772 Liver	96	a) <5-29 ug/kg b) <5-86 ug/kg	a) 12.9 +or- 9.8 ug/kg b) 23.0 +or- 18.0 ug/kg	a) Females b) Males Autopsies. Levels generally lower than those in other countries. No major regional variations. New Zealanders. Death by physical injuries Chem
LIVER; COMPARATIVE EVALUATIONS; ARSENIC; CADMIUM; CHROMIUM; COBALT; COPPER; NEW ZEALAND; AUTOPSIES; LEAD; MANGANESE; MERCURY; NICKEL; SELENIUM; SILVER; ZINC Pickston, L.; Lewin, J.P.; Drysdale, J.M.; Smith, J.M.; Bruce, J. 1983 Journal of Analytical Toxicology 7:2-6				

Arsenic
7440-38-2
As
AtW 74.9216, MP 817 C at 28 atm, BP 613 C (sublimes), VP 1 mm Hg at 380 C, 10 mm Hg at 440 C

Tissue	Cases Exposure Route	Range	Mean	General Information
6778 Liver	a) 10 b) 7 c) 8 d) 9 e) 12	a) Not given b) Not given c) Not given d) Not given e) Not given	a) 0.041 +or- 0.010 ug/g b) 0.097 +or- 0.015 ug/g c) 0.217 +or- 0.015 ug/g d) 0.431 +or- 0.052 ug/g e) 4.92 +or- 1.370 ug/g Dry wt	a) Controls b) Micronodular cirrhosis c) Macronodular cirrhosis d) Mixed cirrhosis e) Alcoholic cirrhosis, drank "home-made brew" containing 0.06-4.44 ug/ml As. Autopsies, 25-60 yr old liver cirrhosis patients and controls who died of non-hepatic causes, India NA

INDIA; AUTOPSIES; CIRRHOSIS; LIVER DISEASES; HAIR; LIVER; NAILS; ARSENIC; ALCOHOLIC BEVERAGES; BIOACCUMULATION
Dhawan, D.; Narang, A.P.S.; Datta, D.V. 1983 Toxicology Letters 15:105-108

Tissue	Cases Exposure Route	Range	Mean	General Information
6774 Liver	28	a) Not given b) Not given	a) 145 +or- 45.4 ng/g b) 112 +or- 24.3 ng/g Wet wt	a) Men b) Women Autopsies, normal tissues. In decreasing order of % of total: As(V), As(III), methylated compounds 36-70 yr olds, unknown exposure, Japan. AAS

JAPAN; AUTOPSIES; CADAVERS; AORTA; ADRENAL GLANDS; CEREBELLUM; CEREBRUM; KIDNEYS; LIVER; LUNGS; MUSCLES; PANCREAS; SKIN; SPLEEN; ARSENIC
Yamauchi, H.; Yamamura, Y. 1983 Bulletin of Environmental Contamination and Toxicology 31:267-277

Tissue	Cases Exposure Route	Range	Mean	General Information
6775 Liver	1 Ingestion	Not applicable	4.7 ug/g	Autopsy. 9 yr old male, death from unknown causes, exhumation 7 mo after death. Gutzeit

NAILS; BONES; HAIR; KIDNEYS; LIVER; SPINAL CORD; MUSCLES; DELIBERATE EXPOSURE; ARSENIC; AUTOPSIES; CADAVERS; MEASUREMENT METHODS
Pirl, J.N.; Townsend, G.P.; Valaitis, A.K.; Grohlich, D.; Spikes, J.J. 1983 Journal of Analytical Toxicology 7:216-219

Tissue	Cases Exposure Route	Range	Mean	General Information
6776 Lung	22	a) Not given b) Not given	a) 98.0 +or- 26.1 ng/g b) 113 +or- 32.9 ng/g Wet wt	a) Men b) Women Autopsies, normal tissues. In decreasing order of % of total: As(V), As(III), methylated compounds 36-70 yr olds, no known exposure, Japan. AAS

JAPAN; AUTOPSIES; CADAVERS; AORTA; ADRENAL GLANDS; CEREBELLUM; CEREBRUM; KIDNEYS; LIVER; LUNGS; MUSCLES; PANCREAS; SKIN; SPLEEN; ARSENIC
Yamauchi, H.; Yamamura, Y. 1983 Bulletin of Environmental Contamination and Toxicology 31:267-277

Arsenic
7440-38-2
As
AtW 74.9216, MP 817 C at 28 atm, BP 613 C (sublimes), VP 1 mm Hg at 380 C, 10 mm Hg at 440 C

Tissue	Cases Exposure Route	Range	Mean	General Information
6777 Milk	a) 10 b) 17 c) 5	a) 0.2-1.1 ug/kg b) 0.62-3.8 ug/kg c) 0.65-5.5 ug/kg Dry wt	a) 0.64 +or- 0.39 ug/kg b) 1.5 +or- 0.9 ug/kg c) 3.3 +or- 1.7 ug/kg Dry wt	a) Colostrum (1st or 2nd day postpartum) b) Transitional milk (3-8 days postpartum) c) Mature milk (1-8 mo postpartum) Slovenia, Yugoslavia NA
MILK; ARSENIC; CADMIUM; COBALT; COPPER; MERCURY; IODINE; MANGANESE; ANTIMONY; SELENIUM; VANADIUM; ZINC; YUGOSLAVIA; ENVIRONMENTAL EXPOSURE Kosta, L.; Byrne, A.R.; Dermelj, M. 1983 Science of the Total Environment 29:261-268				

Tissue	Cases Exposure Route	Range	Mean	General Information
6776 Muscle	22	a) Not given b) Not given	a) 109 +or- 42.7 ng/g b) 104 +or- 18.2 ng/g Wet wt	a) Men b) Women Autopsies, normal tissues. In decreasing order of % of total: As(V), As(III), methylated compounds 36-79 yr olds, no known exposure, Japan. AAS
JAPAN; AUTOPSIES; CADAVERS; AORTA; ADRENAL GLANDS; CEREBELLUM; CEREBRUM; KIDNEYS; LIVER; LUNGS; MUSCLES; PANCREAS; SKIN; SPLEEN; ARSENIC Yamauchi, H.; Yamamura, Y. 1983 Bulletin of Environmental Contamination and Toxicology 31:267-277				

Tissue	Cases Exposure Route	Range	Mean	General Information
6779 Muscle	1 Ingestion	Not applicable	3.4 ug/g	Autopsy, thigh muscle. 44 yr old female, death from acute As overdose. Exhumation 3 wk after death. Gutzeit
NAILS; BONES; HAIR; KIDNEYS; LIVER; SPINAL CORD; MUSCLES; DELIBERATE EXPOSURE; ARSENIC; AUTOPSIES; CADAVERS; MEASUREMENT METHODS Pirl, J.N.; Townsend, G.P.; Valaitis, A.K.; Grohlich, D.; Spikes, J.J. 1983 Journal of Analytical Toxicology 7:216-210				

Arsenic
7440-38-2
As
AtW 74.9216, MP 817 C at 28 atm, BP 613 C (sublimes), VP 1 mm Hg at 380 C, 10 mm Hg at 440 C

Tissue	Cases Exposure Route	Range	Mean	General Information
8760 Nail	a) 1 b) 1 c) 1 d) 1 e) 1 f) 1 g) 1	a) Not given b) Not given c) Not given d) Not given e) Not given f) Not given g) Not given	a) 2088 ppm b) 1452 ppm c) 105 ppm d) 1731 ppm e) 1000 ppm f) 434 ppm g) 5046 ppm	a) 30 yr old father b) 30 yr old mother c) 8 yr old child d) 7 yr old child e) 5.5 yr old child f) 2.5 yr old child g) 1 yr old child Samples from family at initial visit to clinic. Normal levels 0.0-1.8 ppm Rural WI family of 8, ages 1-30 yr, chronic exposures from burning treated wood in stove (ashes in area >1000 ppm, nearby 100-600 ppm. Air, 0.300 ug/cu m). Living area measurements in summer. Cr, Cu, As may have contributed to problems involving eyes, respiratory system (severe irritation, pneumonic problems), CNS (sensation loss, disorientation, seizures, blackouts, headaches), GI (diarrhea), blood, reproductive system, skin, liver (hepatitis) Muscle cramps, nosebleeds, bruises, sinusitis, dermatitis AAS
NAILS; HAIR; ARSENIC; ENVIRONMENTAL EXPOSURE; WISCONSIN Peters, H.A.; Croft, W.A.; Woolson, E.A.; Darcey, B.A.; Olson, M.A. 1984 Journal of the American Medical Association 251(18):2393-2396				

Tissue	Cases Exposure Route	Range	Mean	General Information
8761 Nail	a) About 100 b) About 50 Ingestion	a) Not given b) Not given	a) 4.55+/-2.25 ug/g b) 0.42+/-0.24 ug/g	a) Exposed individuals. 0.41 mg/l in drinking water b) Non-exposed individuals. 0.005 mg/l in drinking water Levels in a) unrelated to length of exposure. Comparable groups with and without cutaneous poisoning signs, of inhabitants of a town with high arsenic content in the drinking water. Control group. Mexico AAS
BLOOD; HAIR; NAILS; URINE; CONSUMER EXPOSURE; MEXICO; COMPARATIVE EVALUATIONS; ARSENIC; DRINKING WATER; POPULATION EXPOSURE Olguin, A.; Jauge, P.; Cebrian, M.; Alborce, A. 1983 Proceedings of the Western Phamacology Society 26:175-177				

Tissue	Cases Exposure Route	Range	Mean	General Information
8762 Nail	8 Inhalation Dermal	100-5000 ppm	Not given	Chromate-copper-arsenic-treated wood burned in home Rural family Conjunctivitis, bronchitis, sensory hyperesthesia, muscle cramps, dermatitis, nosebleeds, ear infections, gastrointestinal disturbance, alopecia
ARSENIC; CHROMIUM; COPPER; AIR POLLUTION; HEALTH HAZARDS; ADOLESCENTS; ADULTS; CHILDREN; DERMATITIS; SKIN DISEASES; COMPARATIVE EVALUATIONS Peters, H.A.; Croft, W.A.; Woolson, E.A.; Darcey, B.A.; Olson, M.A. 1983 New England Journal of Medicine 306(22):1360-1361				

Arsenic
7440-38-2
As
AtW 74.9216, MP 817 C at 28 atm, BP 613 C (sublimes), VP 1 mm Hg at 380 C, 10 mm Hg at 440 C

Tissue	Cases Exposure Route	Range	Mean	General Information
8783 Nail	5	0.06-4.64	Not given	Autopsy samples Alcohol cirrhosis patients, drank "home-made brew" containing 0.06-4.64 ug/ml As, India. NA
INDIA; AUTOPSIES; CIRRHOSIS; LIVER DISEASES; HAIR; LIVER; NAILS; ARSENIC; ALCOHOLIC BEVERAGES; BIOACCUMULATION Dhawan, D.; Narang, A.P.S.; Datta, D.V. 1983 Toxicology Letters 15:105-108				

Tissue	Cases Exposure Route	Range	Mean	General Information
8784 Nail	Ingestion	a) Not applicable b) Not applicable c) Not applicable d) Not applicable e) Not applicable f) Not applicable g) Not applicable h) Not applicable	a) 132 ug/g b) 40 ug/g c) 34 ug/g d) 9.4 ug/g e) 37 ug/g f) 14 ug/g g) 13 ug/g h) 0.75 ug/g	a) Proximal fingernail root. Female, death from acute As overdose, exhumation 3 wk after death b) Medial fingernail root c) Fingernail, proximal (0-5 mm). Male, death from unknown causes, exhumation 7 mo after death d) Distal (5-10 mm) e) Toenail, proximal (0-5 mm), same male f) Medial (5-10 mm) g) Distal (10-15 mm) h) Undigested nail composite, same male. Autopsies, 44 *yr* old female, 9 yr old male Gutzeit
NAILS; BONES; HAIR; KIDNEYS; LIVER; SPINAL CORD; MUSCLES; DELIBERATE EXPOSURE; ARSENIC; AUTOPSIES; CADAVERS; MEASUREMENT METHODS Pirl, J.N.; Townsend, G.F.; Valaitis, A.K.; Grohlich, D.; Spikes, J.J. 1983 Journal of Analytical Toxicology 7:216-219				

Tissue	Cases Exposure Route	Range	Mean	General Information
8785 Pancreas	18	a) Not given b) Not given	a) 156 +or- 82.0 ng/g b) 152 +or- 60.4 ng/g Wet wt	a) Men b) Women Autopsies, normal tissues. In decreasing order of % of total: As(V), As(III), methylated compounds 36-79 yr olds, no known exposure, Japan. AAS
8786 Skin	22	a) Not given b) Not given	a) 134 +or- 51.9 ng/g b) 172 +or- 129 ng/g Wet wt	a) Men b) Women Autopsies, normal tissues. In decreasing order of % of total: As(V), As(III), methylated compounds 36-79 yr olds, no known exposure, Japan. AAS
JAPAN; AUTOPSIES; CADAVERS; AORTA; ADRENAL GLANDS; CEREBELLUM; CEREBRUM; KIDNEYS; LIVER; LUNGS; MUSCLES; PANCREAS; SKIN; SPLEEN; ARSENIC Yamauchi, H.; Yamamura, Y. 1983 Bulletin of Environmental Contamination and Toxicology 31:267-277				

Arsenic

7440-38-2
As
AtW 74.9216, MP 817 C at 36 atm, BP 613 C (sublimes), VP 1 mm Hg at 380 C, 10 mm Hg at 440 C

Tissue	Cases Exposure Route	Range	Mean	General Information
8767 Spinal cord	1 Ingestion	Not applicable	2.2 ug/g	Autopsy. 44 yr old female, death from acute As overdose. Exhumation 3 wk after death. Gutzeit
NAILS; BONES; HAIR; KIDNEYS; LIVER; SPINAL CORD; MUSCLES; DELIBERATE EXPOSURE; ARSENIC; AUTOPSIES; CADAVERS; MEASUREMENT METHODS Pirl, J.N.; Townsend, G.F.; Valaitis, A.K.; Grohlich, D.; Spikes, J.J. 1988 Journal of Analytical Toxicology 7:216-219				

Tissue	Cases Exposure Route	Range	Mean	General Information
8766 Spleen	30	a) Not given b) Not given	a) 101 +or- 58.7 ng/g b) 101 +or- 41.2 ng/g Wet wt	a) Men b) Women Autopsies, normal tissues. In decreasing order of % of total: As(V), As(III), methylated compounds 56-70 yr olds, no known exposure, Japan. AAS
JAPAN; AUTOPSIES; CADAVERS; AORTA; ADRENAL GLANDS; CEREBELLUM; CEREBRUM; KIDNEYS; LIVER; LUNGS; MUSCLES; PANCREAS; SKIN; SPLEEN; ARSENIC Yamauchi, H.; Yamamura, Y. 1983 Bulletin of Environmental Contamination and Toxicology 31:267-277				

Tissue	Cases Exposure Route	Range	Mean	General Information
8769 Urine	a) 680 b) 96 c) 144	a) Not given b) Not given c) Not given	a) 33.8+/-31.4 ug/L b) 24.5+/-23.5 ug/L c) 21.4+/-23.1 ug/L Density corrected	a) Active smelter workers b) Retirees and ex-employees of smelter c) Copper and gold miners, never employed in smelter Data also given for different job catagories of smelter workers AAS
BLOOD; URINE; OCCUPATIONAL EXPOSURE; ADULTS; CADMIUM; LEAD; ARSENIC; INDUSTRIAL PLANTS; SMELTERS; ZINC ORGANIC COMPOUNDS Lilis, R.; Valciukas, J.A.; Weber, J.P.; Fischbein, A.; Nicholson, W.J.; Campbell, C.; Malkin, J.; Selikoff, I.J. 1984 Environmental Research 33:76-95				

Arsenic
7440-38-2
As
AtW 74.9216, MP 817 C at 26 atm, BP 613 C (sublimes), VP 1 mm Hg at 380 C, 10 mm Hg at 440 C

Tissue	Cases Exposure Route	Range	Mean	General Information
8790 Urine	169 Inhalation Ingestion Dermal	a) 0.6-46 ug/l b) 85-12500 ug/l c) 60-138 ug/l d) 1-108 ug/l e) 8-47 ug/l	a) 17.2+/-11.1 ug/l b) Not given c) 88.7+/-34 ug/l d) 33.9+/-23.4 ug/l e) 25.7 ug/l	a) Reference population, 148 subjects b) 1 subject, 3 & 36 d after ingesting approx 3 g As2O3, peak on day 3 c) Glass mix makers, air levels As2O3=4.5-619 ug/cu m d) Glass blowers & casters, air levels=0.6-2.0 ug/cu m e) Storers & clerks, indirect exposures Levels correlated with blood levels. Ashed samples Healthy males, mean age 33 yr 36% nonsmokers, no occupational exposure. 18 yr old, attempted suicide. 42 yr old glass factory workers,employed 18+/-9 yr, exposure intensity varied with task. In case of acute poisoning: diarrhea & vomiting 2 hr after ingestion AAS
ARSENIC; OCCUPATIONAL EXPOSURE; BLOOD; URINE; SUICIDE; DELIBERATE EXPOSURE; BIOLOGICAL MONITORING; ITALY Foa, V.; Colombi, A.; Maroni, M.; Buratti, M.; Calzaferri, G. 1984 Science of the Total Environment 34:241-259				

Tissue	Cases Exposure Route	Range	Mean	General Information
8791 Urine	8 Ingestion	0.01-1.60 ppm	0.65 ppm	Subacute poisoning from ingesting contaminated (108 ppm) well water. Family members ill with GI symptoms for week prior to examination. Estimated exposure 26-127 mg for survivors, 77 mg and 166 mg for 2 who died. 4-37 yr olds, farm family exposed thru drinking water Gastrointestinal symptoms, periobital swelling, headache, back pain, sore throat, epistaxis, excessive thirst. Marrow suppression, coma, peripheral neuropathology, hematologic, hepatic, and renal abnormalities, death in 2 cases. Modified Gutzeit
URINE; BLOOD; LIVER; CONSUMER EXPOSURE; ENVIRONMENTAL EXPOSURE; VIRGINIA; AUTOPSIES; CASE HISTORIES; ARSENIC; METALS; ACCIDENTAL POISONING; WATER POLLUTION; DRINKING WATER; FARMS; PESTICIDES Armstrong, C.W.; Stroube, R.B.; Rubio, T.; Siudyla, E.A.; Miller, G.B. 1984 Archives of Environmental Health 39(4):276-279				

Tissue	Cases Exposure Route	Range	Mean	General Information
8792 Urine	a) About 100 b) About 50 Ingestion	a) Not given b) Not given	a) 0.30+/-0.18 ug/ml b) 0.01+/-0.01 ug/ml	a) Exposed individuals. 0.41 mg/l in drinking water b) Non-exposed individuals. 0.005 mg/l in drinking water Levels in a) unrelated to length of exposure. Comparable groups with and without cutaneous poisoning signs, of inhabitants of a town with high arsenic content in the drinking water. Control group. Mexico Exposed individuals with cutaneous signs of chronic poisoning had significantly (about 20%) higher levels than those without such signs AAS
BLOOD; HAIR; NAILS; URINE; CONSUMER EXPOSURE; MEXICO; COMPARATIVE EVALUATIONS; ARSENIC; DRINKING WATER; POPULATION EXPOSURE Olguin, A.; Jauge, P.; Cebrian, M.; Albores, A. 1983 Proceedings of the Western Pharmacology Society 26:175-177				

Arsenic

7440-38-2
As
AtW 74.9216, MP 817 C at 28 atm, BP 613 C (sublimes), VP 1 mm Hg at 380 C, 10 mm Hg at 440 C

Tissue	Cases Exposure Route	Range	Mean	General Information
8795 Urine	1 Ingestion	a) Not given b) Not given c) Not given d) Not given e) Not given f) Not given g) Not given h) Not given	a) 21.7 ug b) 37.6 ug c) 645.7 ug d) 669.1 ug e) 4.89 ug f) 2.90 ug g) 2.33 ug h) 3.92 ug	a) Inorganic As after 747 ug b) Inorganic As after 750 ug c) As in trimethylarsenic (TMA) after 747 ug d) As in TMA after 750 ug e) As in metabolite methylarsonic acid (MAA) after 747 ug f) As in MAA acid after 750 ug g) As in dimethylarsinic acid (DMAA) after 747 ug h) As in DMAA after 750 ug Cumulative excretion for 72 hr. As consumed was 98.8% TMA, 0.96% inorganic As and 0.14% DMAA. 2 wk between experiments. Adult volunteer, Japan AAS
URINE; DELIBERATE EXPOSURE; JAPAN; ADULTS; ARSENIC; METABOLISM Yamauchi, H.; Yamamura, Y. 1984 Bulletin of Environmental Contamination and Toxicology 32:682-687				

Tissue	Cases Exposure Route	Range	Mean	General Information
8794 Urine	147 Ingestion	6-406.4 ug/l	Not given	1-4781 ug/l in well water. Ingestion calculated to be 1-4521 ug/day. <60 yr old adults, Alaska Chem
ALASKA; ADULTS; NEUROLOGIC MANIFESTATIONS; UTERUS; COMPARATIVE EVALUATIONS; ARSENIC; DRINKING WATER; RURAL AREAS Kreiss, K.; Zack, M.M.; Feldman, R.G.; Nilec, C.A.; Chirico-Post, J.; Sax, D.S.; Landrigan, P.J.; Boyd, M.H.; Cox, D.H. 1983 Archives of Environmental Health 38(2):116-121				

Tissue	Cases Exposure Route	Range	Mean	General Information
8795 Urine	a) 252 b) 15 c) 22 d) 43 e) 10	a) Not given b) Not given c) Not given d) Not given e) Not given	a) 74+/-73 ug/l b) 44+/-36 ug/l c) 98+/-76 ug/l d) 117+/-158 ug/l e) 148+/-112 ug/l Range of means	a) Controls, (from general unexposed population) b) Possible exposure (professionals, administrators, etc.) c) Low-exposure (plant superintendent, supervisors, foremen, fingerlift operators) d) Moderate-exposure (equipment operators, laborers, drivers, maintenance workers, warehousemen) e) High-exposure (treating plant operators) Employees in wood treatment process. Exposures to chromated Cu arsenate preservatives. Wood treaters: 5-952 ug/l, mean 103 ug/l. Controls: 5-365 ug/l, mean 74 ug/l. Hawaiians, Caucasians, Filipinos, Japanese AAS
WOOD PRESERVATIVES; ARSENIC; CHROMIUM; COPPER; URINE; HAWAII; COMPARATIVE EVALUATIONS; RACIAL STUDIES; OCCUPATIONAL EXPOSURE; HEALTH HAZARDS; INHALATION; OCCUPATIONAL HAZARDS Takahashi, W.; Pfenninger, K.; Wong, L. 1983 Archives of Environmental Health 38(4):209-214				

Asbestos
1332-21-4
EXACT COMPOSITION UNKNOWN OR UNDETERMINED

Tissue	Cases Exposure Route	Range	Mean	General Information
8796 Lung	2	a) 30.8+/-3.4-45.8+/-5.4 X 10(E+6) b) 49.4+/-8.3-51.3+/-5.3 X 10(E+6) Fibers/g dry wt	a) 37.8+/-2.2 X 10(E+6) b) Not given Fibers/g dry wt	a) Subject A, all lobes, slices from periphery of lung, 77 samples b) Subject B, range of means from 30 lower lobe samples, slices from periphery of lung Autopsies. Range of means. Lowest in middle lobes, higher in lower lobes. Other values given for subject B, subpleural transects of upper lobe. Data for fibers divided into coated and uncoated, percent coated varied from 5.5-13.9%. Cause of death not asbestosis. 53 yr old (Subject A) and 67 yr old (Subject B) employed for 30 and 24 yr respectively, Anthophyllite mine, Finland Asbestosis Microscopy
LUNGS; OCCUPATIONAL EXPOSURE; FINLAND; ADULTS; AUTOPSIES; OCCUPATIONAL DISEASES; PULMONARY DISEASES; ASBESTOS; FIBERS; MINING Morgan, A.; Holmes, A. 1984 Environmental Research 33:62-75				

Tissue	Cases Exposure Route	Range	Mean	General Information
8797 Lung	1 Inhalation	a) Not given b) Not given	a) 123,000+/-67,000 b) 493,000+/-174,000 Fibers/g dry tissue	a) Coated fibers b) Uncoated fibers Worked with talc 12 yr, chrysotile and crocidolite fiber levels within range for normal urban population. Amosite fibers elevated to 3 million fibers/g dry tissue. This is 6x upper range for normal urban population. 44 yr old resident of Australia Pleural mesothelioma Microscopy
LUNGS; OCCUPATIONAL EXPOSURE; AUSTRALIA; INDUSTRIAL DISEASES; NEOPLASMS; OCCUPATIONAL DISEASES; BIOPSIES; ASBESTOS; FIBERS; INHALATION Barnes, R.; Rogers, A.J. 1984 Medical Journal of Australia 140:488-490				

Tissue	Cases Exposure Route	Range	Mean	General Information
8798 Lung	a) 3 b) 7 c) 9 d) 6 Inhalation	a) 10->1000 b) <10-greater than 600 c) <5-greater than 700 d) <5-greater than 5000 Asbestos bodies/g wet wt	a) 83 b) 19 c) 44 d) 159 Asbestos bodies/g wet wt Medians	a) Exposed b) Probably exposed c) Possibly exposed d) Not likely to have been exposed Exceeding "normal" in 56% of cases. Discussion of correlation of data from autopsies and roentgenography with occupational exposure as well as tumors. U.S. Veterans (62.3 yr old), from 434 autopsies done 10/80-4/83. Had posterolateral chest wall and/or diaphragmatic pleural plaques. Pleural plaques, asbestos bodies Microscopy
OCCUPATIONAL EXPOSURE; ASBESTOS; NEOPLASMS; AUTOPSIES; OCCUPATIONAL HAZARDS Wain, S.L.; Roggli, V.L.; Foster, W.L. 1984 Chest 86(5):707-713				

Asbestos
1332-21-4
EXACT COMPOUND UNKNOWN OR UNDETERMINED

Tissue	Cases Exposure Route	Range	Mean	General Information
8700 Lung	9 Inhalation	a) 15.0-44.4 b) 3.7-16.9 c) 19.3-81.6 d) 5.6-54.6 e) 0.7-39.7 f) 1.1-67.3 x10(E+6) fibers/g dry wt	a) 26.9 b) 9.0 c) 45.6 d) 26.7 e) 11.3 f) 21.9 x10(E+6) fibers/g dry wt	a) Chrysotile, normal lung b) Chrysotile, asbestotic lung c) Tremolite, normal lung d) Tremolite, asbestotic lung e) Amosite/crocidolite, normal lung f) Amosite/crocidolite, asbestotic lung Levels varied significantly from site to site, 5 different levels given for each subject. Subjects with histories of asbestos exposure Fibrotic lung, 6 cases EM; X-ray spectrom
LUNGS; ENVIRONMENTAL EXPOSURE; OCCUPATIONAL EXPOSURE; ADULTS; PULMONARY DISEASES; MEASUREMENT METHODS; ASBESTOS; FIBERS; BIOCONCENTRATION Churg, A.; Wood, P. 1983 Environmental Research 31:374-380				

Asbestos, grunerite
12172-73-5
EXACT COMPOUND UNKNOWN OR UNDETERMINED

Tissue	Cases Exposure Route	Range	Mean	General Information
8800 Lung	a) 18 b) 11 c) 12 Inhalation	a) 0-6 b) 0 c) 0-471,102 Ferruginous bodies/g	a) Not given b) Not given c) 341,035 Ferruginous bodies/g	a) Urban area environmentally exposed, no lung cancer b) Non-urban environmentally exposed patients with lung cancer c) Rural asbestos workers, exposed 2 wk-16 yr 9/12 with lung cancer Mean calculated from chart. All smokers with exception of 5. Newborn to 85 yr of age. Tyler and Houston, Texas area Various heart, vascular, pulmonary problems. Cancers, (pancreatic, lung, GI tract, peritoreal), diabetes, cirrhosis Microscopy
LUNGS; OCCUPATIONAL EXPOSURE; ENVIRONMENTAL EXPOSURE; CONSUMER EXPOSURE; TEXAS; AUTOPSIES; PULMONARY DISEASES; NEOPLASMS; SARCOMAS; BIOPSIES; ASBESTOS; BIOACCUMULATION; FIBERS; OCCUPATIONAL HAZARDS; POPULATION EXPOSURE; RURAL AREAS; URBAN AREAS Dodson, R.F.; Greenberg, S.D.; Williams, M.G., Jr.; Corn, C.J.; O'Sullivan, M.F.; Hurst, G.A. 1984 Journal of the American Medical Association 252(1):68-71				

Barium
7440-39-3
Ba
AtW 137.34, MP 710 C (approx), BP 1660 C (approx), VP 10 mm Hg at 1049 C

Tissue	Cases Exposure Route	Range	Mean	General Information
8801 Blood, plasma	1 Ingestion	15-140 umol/l	Not given	12-114 hr after ingesting 40 g as carbonate. Peak at 42 hr, low at 114 hr. Range of means estimated from graph 39 yr old woman Abdominal pain, diarrhea, vomiting, muscle weakness, respiratory failure, paralysis, hypokalemia, renal insufficiency Vastus medialis muscle, mild, non-specific atrophy. During paralysis muscle electrically silent, unexcitable, nerve action potentials. Recovery - low amplitude, short "myopathic" units ES
BLOOD PLASMA; DELIBERATE EXPOSURE; CASE HISTORIES; SUICIDE; BARIUM; POTASSIUM Phelan, D.M.; Hagley, S.R.; Guerin, M.D. 1984 British Medical Journal 289:882				

Tissue	Cases Exposure Route	Range	Mean	General Information
8802 Blood, plasma		a) Not given b) Not given c) Not given	a) 0.062+/-0.017 ug/mL b) 0.071+/-0.023 ug/mL c) 0.050+/-0.010 ug/mL	a) Insulin-treated diabetics b) Non-insulin-treated diabetics c) Control non-diabetics Collected after overnight fasting. Significant difference between b), c) and a), b). 18-78 yr olds, Oxford, England NA; AAS
BLOOD PLASMA; ENGLAND; DIABETES; METABOLISM; MINERAL METABOLISM; ALUMINUM; ANTIMONY; ARSENIC; BARIUM; BROMINE; CADMIUM; CALCIUM; CESIUM; CHROMIUM; COBALT; COPPER; IODINE; IRON; LEAD; MAGNESIUM; MANGANESE; MERCURY; MOLYBDENUM; NICKEL; RUBIDIUM; SCANDIUM; SELENIUM; SILVER; TIN; VANADIUM; ZINC Ward, N.I.; Pim, B. 1984 Biological Trace Element Research 6:469-487				

Benzamide, p-amino-N-(2-(diethylamino)ethyl)- (8 CI); Benzamide, 4-amino-N-(2-(diethylamino)ethyl)- (9 CI)
51-06-9
C13-H21-N3-O
MW 235.37

Tissue	Cases Exposure Route	Range	Mean	General Information
8803 Urine	9 Ingestion	a) Not given b) Not given c) Not given d) Not given	a) 2.89+/-0.24 ml/min/kg b) 1.85+/-0.12 ml/min/kg c) 80.23+/-7.90 ml/min d) 75.54+/-4.44 ml/min	a) Control, before cimetidine b) Parent compound after cimetidine c) n-Acetylprocainamide metabolite, control, before cimetidine d) Metabolite, after cimetidine Renal clearance. Cimetidine dose was 1000 ug. Healthy volunteers, 25-40 yr old HPLC
BLOOD PLASMA; URINE; DELIBERATE EXPOSURE; ADULTS; KIDNEY DISEASES; GASTROINTESTINAL DISEASES; ANTIHISTAMINES; BIOACCUMULATION; BIOAVAILABILITY; METABOLITES; DRUGS Christian, C.D., Jr.; Meredith, C.G.; Speeg, K.V., Jr. 1984 Clinical Pharmacology and Therapeutics 36(2):221-227				

Benzene, chloro-
108-90-7
C6-H5-Cl
MW 112.56, MP -45 C, BP 131.7 C, VP 10 mm Hg at 22.2 C

Tissue	Cases Exposure Route	Range	Mean	General Information
8804 Breath	a) 9 b) 8	a) 0.07-8.15 ug/cu m b) 0.09-3.0 ug/cu m	a) 0.2 ug/cu m b) Not given Median	a) Bayonne and Elizabeth, NJ. 4 chemical and oil workers, 4 persons with no occupational exposure, 1 sewage plant operator b) Research Triangle Park, NC subjects with no occupational exposure Food generally unimportant as exposure source. Adult volunteers GC-MS
BREATH; ENVIRONMENTAL EXPOSURE; OCCUPATIONAL EXPOSURE; NEW JERSEY; NORTH CAROLINA; CHLORINATED HYDROCARBONS; CHLORINE ORGANIC COMPOUNDS; VOLATILE ORGANIC COMPOUNDS; BIOLOGICAL MONITORING; DRINKING WATER; FOODS Wallace, L.A.; Pellizzari, E.; Hartwell, T.; Rosenzweig, M.; Erickson, M.; Sparacino, C.; Zelon, H. 1984 Environmental Research 35:293-319				

Tissue	Cases Exposure Route	Range	Mean	General Information
8805 Urine	5 Ingestion Inhalation	a) Not given b) Not given c) Not given d) Not given e) Not given f) Not given	a) 17.64x10(E-5)+/-10.44x10(E-5) mmol/kg b) 0.093+/-0.0008 mmol/kg c) 0.186 mmol d) 25.44 mmol/kg e) 0.285 mmol/kg f) 8.633 mmol/kg	a) Metabolite p-chlorophenylmercapturic acid (MA) after 0.3 mmol Lg monochlorobenzene, 1 case b) Metabolite 4-chlorocatichol (4CC) c) MA after 0.84 ppm x 415 min, 1 case d) 4CC e) MA after 0.5 ppm x 228 min, 1 case f) 4CC Cumulative excretion. 57 yr old volunteer and factory workers (average age 30 yr) HPLC
URINE; DELIBERATE EXPOSURE; OCCUPATIONAL EXPOSURE; ADULTS; CHLOROBENZENES; INHALATION; FUMES; INDUSTRIAL ATMOSPHERES; METABOLITES Ogata, M.; Shimada, Y. 1983 International Archives of Occupational and Environmental Health 53:51-57				

Benzene, dichloro-
25321-22-6
C6-H4-Cl2
MW 147.01, BP 173-180 C

Tissue	Cases Exposure Route	Range	Mean	General Information
8806 Breath	a) 9 b) 8	a) 0.10-0.10 ug/cu m b) 0.09-0.76 ug/cu m	a) 0.1 ug/cu m b) Not given	a) Bayonne and Elizabeth, NJ. 4 chemical and oil workers, 4 persons with no occupational exposure, 1 sewage plant operator b) Research Triangle Park, NC subjects with no occupational exposure Food generally unimportant as exposure route. Adult volunteers GC-MS
BREATH; ENVIRONMENTAL EXPOSURE; OCCUPATIONAL EXPOSURE; NEW JERSEY; NORTH CAROLINA; CHLORINATED HYDROCARBONS; CHLORINE ORGANIC COMPOUNDS; VOLATILE ORGANIC COMPOUNDS; BIOLOGICAL MONITORING; DRINKING WATER; FOODS Wallace, L.A.; Pellizzari, E.; Hartwell, T.; Rosenzweig, M.; Erickson, M.; Sparacino, C.; Zelon, H. 1984 Environmental Research 35:293-319				

Benzene, ethyl-
100-41-4
C8-H10
MW 106.16, MP -94.97 C, BP 136.25 C, VP 10 mm Hg at 25.9 C

Tissue	Cases Exposure Route	Range	Mean	General Information
8607 Lung	25 Inhalation	52-65%	49+/5%	% retention of vapors after exposure ranging from 20.2-447.6 mg. Healthy volunteers, 27-32 yr old GC
URINE; LUNGS; DELIBERATE EXPOSURE; POLAND; ADULTS; INDUSTRIAL DISEASES; INDUSTRIAL HYGIENE; INDUSTRIAL MEDICINE; BIOACCUMULATION; HEALTH HAZARDS; INDUSTRIAL ATMOSPHERES; INDUSTRIAL PLANTS; INHALATION; METABOLITES; OCCUPATIONAL HAZARDS Gromiec, J.P.; Piotrowski, J.K. 1984 International Archives of Occupational and Environmental Health 55:61-72				

Tissue	Cases Exposure Route	Range	Mean	General Information
8606 Urine	4 Inhalation	a) Not given b) Not given c) Not given d) Not given e) Not given f) Not given g) Not given h) Not given i) Not given j) Not given	a) 71.5+/-1.5% b) 19.1+/-2.0% c) 4.0+/-0.5% d) 0.15+/-0.05% e) 1.6+/-0.3% f) 72.4+/-4.9% g) 16.8+/-5.0% h) 6.7+/-1.6% i) 0.45+/-0.20% j) 0.82+/-0.11%	a) % mandelic acid metabolite b) % phenylglyoxlic acid metabolite c) % 1-phenylethanol metabolite d) % W-hydroxyacetophenone metabolite e) % m-hydroxyacetophenone metabolite f) Same as a) g) same as h) h) same as c) i) Same as d) j) same as e) a-e), exposure 150 ppm, 24 hr collection, f-j), exposure 150 ppm plus 150 ppm m-xylene, 24 hr collection. Significant differences in 1-phenylethanol ($P<0.05$), W-hydroxylacetophenone ($P<0.05$), and m-hydroxyacetophenone ($P<0.01$). Also measured levels of minor metabolites. Research workers, 33-40 yr old GC/MS
URINE; DELIBERATE EXPOSURE; ADULTS; FINLAND; XYLENE; BENZENES; BIOACCUMULATION; METABOLITES Engstrom, K.; Riihimaki, V.; Laine, A. 1984 International Archives of Occupational and Environmental Health 54;355-363				

Benzene, hexachloro-
118-74-1
C6-Cl6
MW 284.80, MP 231 C, BP 323-326 C, VP 1 mm Hg at 114.4 C

Tissue	Cases Exposure Route	Range	Mean	General Information
8809 Adipose	a) 91 b) 84	a) 10-458 ng/g b) 17-315 ng/g	a) 106+/-70 ng/g b) 78+/-52 ng/g	a) Kingston b) Ottawa Single samples from greater omentum of each cadaver. Significantly different. In general, residue values in entire survey of 20 compounds slightly higher in Kingston. No significant differences by sex. Autopsies, unembalmed cadavers, 11/79-1/31, Kingston, Ontario (a Great Lakes Community) and 11/80-1/81, Ottawa, Ontario (outside Great Lakes Basin), Canada. Age ranges 7-88 yr, 16-91 yr, respectively. GC/MS
ADIPOSE TISSUE; CANADA; AUTOPSIES; PESTICIDES; ENVIRONMENTAL EXPOSURE; CHLORINE ORGANIC COMPOUNDS; CHLOROBENZENES; WATER POLLUTION Williams, D.T.; LeBel, G.L.; Junkins, E. 1984 Journal of Toxicology and Environmental Health 13:19-29				

Tissue	Cases Exposure Route	Range	Mean	General Information
8810 Adipose	105 Ingestion	a) Not given b) Not given c) Not given d) Not given e) Not given f) Not given g) Not given h) Not given i) Not given j) Not given	a) 19.58+/-15.38 ug/kg b) 21.68+/-15.12 ug/kg c) 30.25+/-15.70 ug/ml d) 28.83+/-15.28 ug/kg e) 1.0+/-0.00 ug/kg f) 9.25+/-3.50 ug/kg g) 10.56+/-6.39 ug/kg h) 18.67+/-10.90 ug/kg i) 14.33+/-11.05 ug/kg j) 18.65+/-14.67 ug/kg	a) Men, whole country b) Women, whole country c) Men, South Finland d) Women, South Finland e) Men, <=1 fish meal/mo f) Women <=1 fish meal/mo g) Men, 2-3 fish meals/mo h) Women, 2-3 fish meals/mo i) Men, >=4 fish meals/mo j) Women, >=4 fish meals/mo. Hospital patients and accidental fatalities, 2 mo-91 yr old GC/MS
ADIPOSE TISSUE; ENVIRONMENTAL EXPOSURE; FINLAND; SEX; AGE; AUTOPSIES; BIOPSIES; CHLORINATED HYDROCARBONS: HEPTACHLOR EPOXIDE; HEXACHLOROBENZENE; DOT; POLYCHLORINATED BIPHENYLS; BIOACCUMULATION; BIOLOGICAL MONITORING; DIETS; FISHES; FOOD CONTAMINATION; HEALTH HAZARDS; POPULATION EXPOSURE Mussalo-Rauhamaa, H.; Pyysalo, H.; Mollanen, R. 1984 Journal of Toxicology and Environmental Health 13:689-704				

Tissue	Cases Exposure Route	Range	Mean	General Information
8811 Adipose	a) 45 b) 92	a) Not given b) Not given	a) 0.13 ppm b) 0.07 ppm	a) 1976 b) 1981 Levels higher in 40-60 yr olds than in 30 yr olds. Men higher than women. Use of organochlorine pesticides restricted for about 10 yr. 30->60 yr olds, Matsuyama City, Japan GC-EC
JAPAN; ADIPOSE TISSUE; ENVIRONMENTAL EXPOSURE; CHLORINE ORGANIC COMPOUNDS; DDT; HEPTACHLOROCYCLOHEXANE; HEXACHLOROBENZENE; POLYCHLORINATED BIPHENYLS; PESTICIDE RESIDUES; POPULATION EXPOSURE Mori, Y.; Kikuta, M.; Okinaga, E.; Okura, T. 1983 Bulletin of Environmental Contamination and Toxicology 30:74-79				

Benzene, hexachloro-
118-74-1
C6-Cl6
MW 284.80, MP 231 C, BP 323-326 C, VP 1 mm Hg at 114.4 C

Tissue	Cases Exposure Route	Range	Mean	General Information
8812 Adipose	15	20-170 ug/kg	55 ug/kg	Investigation of residues in autopsy samples. Fat basis. 20-60 yr old traffic accident victims, 1979-80. Ljubljana and Maribor hospitals, Yugoslavia GLC
ADIPOSE TISSUE; MILK; ENVIRONMENTAL EXPOSURE; YUGOSLAVIA; AUTOPSIES; CHLOROBENZENES; HEXACHLOROCYCLOHEXANE; BIOACCUMULATION; LACTATION; PESTICIDE RESIDUES; METABOLISM; Jan, J. 1983 Bulletin of Environmental Contamination and Toxicology 30:595-599				

Tissue	Cases Exposure Route	Range	Mean	General Information
8813 Adipose				Review. Residues detected in various foods and human tissues. Data used to determine dietary intakes.
REVIEW; ADIPOSE TISSUE; MILK; CONSUMER EXPOSURE; ENVIRONMENTAL EXPOSURE; UNITED KINGDOM; INFANTS; CHLOROBENZENES; HEXACHLOROBENZENE; FISHES; FOOD CONTAMINATION; PESTICIDE RESIDUES; METABOLITES; AGRICULTURE Peattie, M.E.; Lindsay, D.G.; Hoodless, R.A. 1984 Science of the Total Environment 34:73-86				

Tissue	Cases Exposure Route	Range	Mean	General Information
8814 Blood	16	a) Not given b) Not given c) Not given d) Not given e) Not given f) Not given g) Not given h) Not given	a) 0.3 ng b) 0.3 ng c) 0.3 ng d) 0.3 ng e) 0.3 ng f) 0.3 ng g) 0.1 ng h) 0.1 ng /g whole blood	a) 7 d after parturition b) 14 d c) 28 d d) 42 d e) 56 d f) 70 d g) 84 d h) 98 d Average of samples collected at each time period. No correlation between levels in milk and blood. Mothers, mean age 35+/-2 yr, mean wt 125+/-8 lb, National Capital Region, (Ottawa), Canada GC
BLOOD; MILK; ENVIRONMENTAL EXPOSURE; CANADA; ADULTS; PESTICIDES; POLYCHLORINATED BIPHENYLS; CHLORINE ORGANIC COMPOUNDS; LACTATION; PESTICIDE RESIDUES; DIELDRIN; DDT; DDE; OXYCHLORDANE; NONACHLOR; HEPTACHLOR EPOXIDE; HEXACHLOROBENZENE; BIOACCUMULATION Mes, J.; Doyle, J.A.; Adams, B.R.; Davies, D.J.; Turton, D. 1984 Archives of Environmental Contamination and Toxicology 13:217-223				

Benzene, hexachloro-
118-74-1
C6-Cl6
MW 284.80, MP 231 C, BP 323-326 C, VP 1 mm Hg at 114.4 C

Tissue	Cases Exposure Route	Range	Mean	General Information
8815 Blood	101	Not given	0.05+/-1.2 ng/g	Sampled on admission. Median, 0.08 ng/g. 95% of these had >0.01 ng/g. 26+/-4 yr olds, maternity facility admissions, urban and rural vicinity of Lake Ontario (Rochester and Oswego), and a mixed population from the Hudson River area (Albany), 1977, NY GC
8816 Blood, fetal	97 Transplacental	Not given	0.1+/-0.9 r g/g	Sampled at delivery. Median 0.05 ng/g. 77% of cases had >0.01 ng/g. Compound preferentially crossed the placenta. Fetuses, delivered in urban and rural vicinity of Lake Ontario (Rochester and Oswego), and a mixed population from the Hudson River area (Albany), 1977, NY GC

BLOOD; FETAL BLOOD; ENVIRONMENTAL EXPOSURE; NEW YORK; COMPARATIVE EVALUATIONS; HEXACHLOROBENZENE; DDE; POLYCHLORINATED BIPHENYLS; BIOACCUMULATION; POPULATION EXPOSURE; TRANSPLACENTAL TRANSFER; PESTICIDE RESIDUES

Buch, B.; Snow, J.; Koblintz, R. 1984 Archives of Environmental Contamination and Toxicology 13:517-527

Tissue	Cases Exposure Route	Range	Mean	General Information
8817 Milk	16	a) Not given b) Not given c) Not given d) Not given e) Not given f) Not given g) Not given h) Not given	a) 4.0 ng b) 8.6 ng c) 4.3 ng d) 4.3 ng e) 3.5 ng f) 3.4 ng g) 2.9 ng h) 3.5 ng /g whole milk	a) 7 d after parturition b) 14 d c) 28 d d) 42 d e) 56 d f) 70 d g) 84 d h) 98 d Average of samples collected at each time period. No correlation between levels in milk and blood. Accumulation of residue in infant body fat theoretically estimated to increase rapidly during 1st 3 mo of breastfeeding, eventually equal to or greater than adult levels Mothers, mean age 35+/-2 yr, mean wt 125+/-8 lb, National Capital Region, (Ottawa), Canada GC

BLOOD; MILK; ENVIRONMENTAL EXPOSURE; CANADA; ADULTS; PESTICIDES; POLYCHLORINATED BIPHENYLS; CHLORINE ORGANIC COMPOUNDS; LACTATION; PESTICIDE RESIDUES; DIELDRIN; DDT; DDE; OXYCHLORDANE; NONACHLOR; HEPTACHLOR EPOXIDE; HEXACHLOROBENZENE; BIOACCUMULATION

Mes, J.; Doyle, J.A.; Adams, B.R.; Davies, D.J.; Turton, D. 1984 Archives of Environmental Contamination and Toxicology 13:217-225

Benzene, hexachloro-
118-74-1
C6-Cl6
MW 284.80, MP 231 C, BP 323-326 C, VP 1 mm Hg at 114.4 C

Tissue	Cases Exposure Route	Range	Mean	General Information
8818 Milk	a) 84 b) 102	a) 0.018-0.36 ppm b) Not detected-0.23 ppm	a) 0.046 +or- 0.049 ppm b) 0.031 +or- 0.025 ppm	a) Hawaii b) Mainland USA Sampled up to 1 mo postpartum. Lipid basis. Mean of positive residues. 1979-80 GC
HAWAII; UNITED STATES; ADULTS; MILK; ALDRIN; CHLORINATED HYDROCARBONS; CHLORINE ORGANIC COMPOUNDS; DDD; DDE; DDT; DIELDRIN; HEPTACHLOR EPOXIDE; HEPTACHLOROCYCLOHEXANE; HEXACHLOROBENZENE; LINDANE; NONACHLOR; OXYCHLORDANE; POLYCHLORINATED BIPHENYLS; PESTICIDE RESIDUES; POPULATION EXPOSURE; ENVIRONMENTAL EXPOSURE Takei, G.H.; Kaushikuua, S.M.; Leong, G.H. 1983 Bulletin of Environmental Contamination and Toxicology 30:606-613				

Tissue	Cases Exposure Route	Range	Mean	General Information
8819 Milk	a) 20 b) 20 c) 20 d) 20 e) 20	a) 0.092-0.52 mg b) 0.088-0.13 mg c) 0.12-0.52 mg d) 0.079-0.19 mg e) 0.11-0.20 mg /kg fat	a) 0.14 +or- 0.11 mg b) 0.11 +or- 0.016 mg c) 0.18 +or- 0.097 mg d) 0.12 +or- 0.027 mg e) 0.14 +or- 0.020 mg /kg fat	a) Umea, north coast b) Osterund, middle c) Stockholm, east coast d) Gothenburg, west coast e) Lund, south Range of 15 samples from mothers in each area. Samples pooled, milk collected 3-5 days postpartum. 1977-79, Sweden GC-EC
SWEDEN; MILK; DDE; DDT; DIELDRIN ; HEXACHLOROCYCLOHEXANE; HEXACHLOROBENZENE; POLYCHLORINATED BIPHENYLS; AGRICULTURE; INDUSTRIAL AREAS; LACTATION; PESTICIDE RESIDUES; POPULATION EXPOSURE; ENVIRONMENTAL EXPOSURE Noren, K. 1983 Ambio 12(1):44-46				

Tissue	Cases Exposure Route	Range	Mean	General Information
8820 Milk	3	a) 0.065-0.077 mg/kg b) 0.020-0.033 mg/kg c) 0.068-0.072 mg/kg d) 0.054-0.061 mg/kg	a) 0.071+/-0.005 b) 0.029+/-0.002 c) 0.071+/-0.003 d) Not given mg/kg	a) Successive fractions, 1 nursing period, mother A b) Successive fractions, 1 nursing period, mother B c) Each nursing period for 24 hr, mother C d) Sample 1X/wk for 4 wk, mother C Fat basis GC
ADULTS; MILK; MEASUREMENT METHODS; PESTICIDES; POLYCHLORINATED BIPHENYLS; LACTATION; HEALTH HAZARDS; ENVIRONMENTAL EXPOSURE Noren, K. 1983 Archives of Environmental Contamination and Toxicology 12:277-283				

Benzene, hexachloro-
118-74-1
C6-Cl6
MW 284.80, MP 231 C, BP 323-326 C, VP 1 mm Hg at 114.4 C

Tissue	Cases Exposure Route	Range	Mean	General Information
8621 Milk	50 Ingestion	a) 0.0007-0.006 mg/kg b) 0.014-0.24 mg/kg	a) 0.0023+/-0.001 3 b) 0.064+/-0.040 mg/kg	a) Milk b) Milk fat (mean of 3.7%) Nonsmokers, 22-38 yr old, ht 153-180 cm, wt 48-90 kg, 1-4 children, Finland. GC/MS
PESTICIDES; ADULTS; MILK; MEASUREMENT METHODS; FINLAND; DDT; DDE; DDD; HEXACHLOROBENZENE; OXYCHLORDANE; POLYCHLORINATED BIPHENYLS; POPULATION EXPOSURE; FOOD CONTAMINATION; WATER POLLUTION; NONACHLOR; ENVIRONMENTAL EXPOSURE Wickstrom, K.; Pyysalo, H.; Simes, M.S. 1983 Bulletin of Environmental Contamination and Toxicology 31:251-256				

Tissue	Cases Exposure Route	Range	Mean	General Information
8622 Milk				Review. Residues detected in various foods and human tissues. Data used to determine dietary intakes.
REVIEW; ADIPOSE TISSUE; MILK; CONSUMER EXPOSURE; ENVIRONMENTAL EXPOSURE; UNITED KINGDOM; INFANTS; CHLOROBENZENES; HEXACHLOROBENZENE; FISHES; FOOD CONTAMINATION; PESTICIDE RESIDUES; METABOLITES; AGRICULTURE Peattie, M.E.; Lindsay, D.G.; Hoodless, R.A. 1984 Science of the Total Environment 34:73-86				

Tissue	Cases Exposure Route	Range	Mean	General Information
8623 Milk, fat	12	Not given	53 ug/kg	3-5 days postpartum. 9-10/81. Mothers in Ljubljana Maternity Clinic, Yugoslavia GLC
8624 Milk, whole	12	1-7 ug/kg	2.1 ug/kg	3-5 days postpartum. 9-10/81. Mothers in Ljubljana Maternity Clinic, Yugoslavia GLC
ADIPOSE TISSUE; MILK; ENVIRONMENTAL EXPOSURE; YUGOSLAVIA; AUTOPSIES; CHLOROBENZENES; HEXACHLOROCYCLOHEXANE; BIOACCUMULATION; LACTATION; PESTICIDE RESIDUES; METABOLISM; Jan, J. 1983 Bulletin of Environmental Contamination and Toxicology 30:595-599				

Benzene, o-dichloro- (8 Cl); Benzene, 1,2-dichloro- (9 Cl)
95-50-1
C6-H4-Cl2
MW 147.0, MP -17.5 C, BP 180-183 C, VP 1 mm Hg at 20.0 C

Tissue	Cases Exposure Route	Range	Mean	General Information
8825 Adipose	15	Not detected-20 ug/kg	13 ug/kg	Investigation of residues in autopsy samples. Fat basis. 20-60 yr old traffic accident victims, 1979-80. Ljubljana and Maribor hospitals, Yugoslavia GLC

ADIPOSE TISSUE; MILK; ENVIRONMENTAL EXPOSURE; YUGOSLAVIA; AUTOPSIES; CHLOROBENZENES; HEXACHLOROCYCLOHEXANE; BIOACCUMULATION; LACTATION; PESTICIDE RESIDUES; METABOLISM;
Jan, J. 1983 Bulletin of Environmental Contamination and Toxicology 30:595-599

Tissue	Cases Exposure Route	Range	Mean	General Information
8826 Adipose				Review. Residues detected in various foods and human tissues. Data used to determine dietary intakes.

REVIEW; ADIPOSE TISSUE; MILK; CONSUMER EXPOSURE; ENVIRONMENTAL EXPOSURE; UNITED KINGDOM; INFANTS; CHLOROBENZENES; HEXACHLOROBENZENE; FISHES; FOOD CONTAMINATION; PESTICIDE RESIDUES; METABOLITES; AGRICULTURE
Peattie, M.E.; Lindsay, D.G.; Hoodless, R.A. 1984 Science of the Total Environment 34:73-86

Tissue	Cases Exposure Route	Range	Mean	General Information
8827 Milk, fat	12	Not given	230 ug/kg	3-5 days postpartum. 9-10/81. Mothers in Ljubljana Maternity Clinic, Yugoslavia GLC
8828 Milk, whole	12	5-12 ug/kg	9 ug/kg	3-5 days postpartum. 9-10/81. Mothers in Ljubljana Maternity Clinic, Yugoslavia GLC

ADIPOSE TISSUE; MILK; ENVIRONMENTAL EXPOSURE; YUGOSLAVIA; AUTOPSIES; CHLOROBENZENES; HEXACHLOROCYCLOHEXANE; BIOACCUMULATION; LACTATION; PESTICIDE RESIDUES; METABOLISM;
Jan, J. 1983 Bulletin of Environmental Contamination and Toxicology 30:595-599

Benzene, p-dichloro- (8 CI); Benzene, 1,4-dichloro- (9 CI)
106-46-7
C6-H4-Cl2
MW 147.01, MP 53 C, BP 174.12 C, VP 10 mm Hg at 54.8 C

Tissue	Cases Exposure Route	Range	Mean	General Information
8829 Adipose	16	Not detected-200 ug/kg	146 ug/kg	Investigation of residues in autopsy samples. Fat basis. 20-60 yr old traffic accident victims, 1979-80. Ljubljana and Maribor hospitals, Yugoslavia GLC
ADIPOSE TISSUE; MILK; ENVIRONMENTAL EXPOSURE; YUGOSLAVIA; AUTOPSIES; CHLOROBENZENES; HEXACHLOROCYCLOHEXANE; BIOACCUMULATION; LACTATION; PESTICIDE RESIDUES; METABOLISM; Jan, J. 1983 Bulletin of Environmental Contamination and Toxicology 30:595-599				

Tissue	Cases Exposure Route	Range	Mean	General Information
8850 Adipose				Review. Residues detected in various foods and human tissues. Data used to determine dietary intakes.
REVIEW; ADIPOSE TISSUE; MILK; CONSUMER EXPOSURE; ENVIRONMENTAL EXPOSURE; UNITED KINGDOM; INFANTS; CHLOROBENZENES; HEXACHLOROBENZENE; FISHES; FOOD CONTAMINATION; PESTICIDE RESIDUES; METABOLITES; AGRICULTURE Peattie, M.E.; Lindsay, D.G., Hoodless, R.A. 1984 Science of the Total Environment 34:73-86				

Tissue	Cases Exposure Route	Range	Mean	General Information
8851 Milk, fat	12	Not given	640 ug/kg	3-5 days postpartum. 9-10/81. Mothers in Ljubljana Maternity Clinic, Yugoslavia GLC
8852 Milk, whole	12	5-35 ug/kg	26 ug/kg	3-5 days postpartum. 9-10/81. Mothers in Ljubljana Maternity Clinic, Yugoslavia GLC
ADIPOSE TISSUE; MILK; ENVIRONMENTAL EXPOSURE; YUGOSLAVIA; AUTOPSIES; CHLOROBENZENES; HEXACHLOROCYCLOHEXANE; BIOACCUMULATION; LACTATION; PESTICIDE RESIDUES; METABOLISM; Jan, J. 1983 Bulletin of Environmental Contamination and Toxicology 30:595-599				

Benzene, pentachloro-
608-93-5
C6-H-Cl5
MW 250.34, MP 86 C, BP 277 C

Tissue	Cases Exposure Route	Range	Mean	General Information
8853 Adipose	a) 91 b) 84	a) Not detected-20 ng/g b) Not detected-4 ng/g	a) 1+/-2 ng/g b) 1+/-5 ng/g	a) Kingston b) Ottawa Single samples from greater omentum of each cadaver. Significantly different - frequency of occurrence was low, thus hard to assess how meaningful. In general, residue values in entire survey of 20 compounds slightly higher in Kingston. No significant differences by sex. Autopsies, unembalmed cadavers, 11/79-1/81, Kingston, Ontario (a Great Lakes Community) and 11/80-1/81, Ottawa, Ontario (outside Great Lakes Basin), Canada. Age ranges 7-88 yr, 16-91 yr, respectively. GC/MS

ADIPOSE TISSUE; CANADA; AUTOPSIES; PESTICIDES; ENVIRONMENTAL EXPOSURE; CHLORINE ORGANIC COMPOUNDS; CHLOROBENZENES; WATER POLLUTION
Williams, D.T.; LeBel, G.L.; Junkins, E. 1984 Journal of Toxicology and Environmental Health 13:19-29

Tissue	Cases Exposure Route	Range	Mean	General Information
8834 Adipose	15	Not detected-3 ug/kg	1.2 ug/kg	Investigation of residues in autopsy samples. Fat basis. 20-60 yr old traffic accident victims, 1979-80. Ljubljana and Maribor hospitals, Yugoslavia GLC
8835 Milk, fat	12	Not given	18 ug/kg	3-5 days postpartum. 9-10/81. Mothers in Ljubljana Maternity Clinic, Yugoslavia GLC
8836 Milk, whole	12	Not detected-3 ug/kg	0.7 ug/kg	3-5 days postpartum. 9-10/81. Mothers in Ljubljana Maternity Clinic, Yugoslavia GLC

ADIPOSE TISSUE; MILK; ENVIRONMENTAL EXPOSURE; YUGOSLAVIA; AUTOPSIES; CHLOROBENZENES; HEXACHLOROCYCLOHEXANE; BIOACCUMULATION; LACTATION; PESTICIDE RESIDUES; METABOLISM;
Jan, J. 1983 Bulletin of Environmental Contamination and Toxicology 30:595-599

Benzene, 1,2,3-trichloro-
87-61-6
C6-H3-Cl3
MW 181.46, MP 52.6 C, BP 221 C, VP 1 mm Hg at 40 C

Tissue	Cases Exposure Route	Range	Mean	General Information
8837 Adipose	a) 91 b) 84	a) Not detected-1320 ng/g b) Not detected-8 ng/g	a) 20+/-139 ng/g b) 1+/-0.8 ng/g	a) Kingston b) Ottawa Single samples from greater omentum of each cadaver. Significantly different - frequency of occurrence was low, thus hard to assess how meaningful. In general, residue values in entire survey of 20 compounds slightly higher in Kingston. No significant differences by sex Autopsies, unembalmed cadavers, 11/79-1/81, Kingston, Ontario (a Great Lakes Community) and 11/80-1/81, Ottawa, Ontario (outside Great Lakes Basin), Canada. Age ranges 7-88 yr, 16-91 yr, respectively. GC/MS
ADIPOSE TISSUE; CANADA; AUTOPSIES; PESTICIDES; ENVIRONMENTAL EXPOSURE; CHLORINE ORGANIC COMPOUNDS; CHLOROBENZENES; WATER POLLUTION Williams, D.T.; LeBel, G.L.; Junkins, E. 1984 Journal of Toxicology and Environmental Health 13:19-29				

Tissue	Cases Exposure Route	Range	Mean	General Information
8838 Adipose	15	20-180 ug/kg	103 ug/kg	Investigation of residues in autopsy samples. Fat basis. 20-60 yr old traffic accident victims, 1979-80. Ljubljana and Maribor hospitals, Yugoslavia GLC
ADIPOSE TISSUE; MILK; ENVIRONMENTAL EXPOSURE; YUGOSLAVIA; AUTOPSIES; CHLOROBENZENES; HEXACHLOROCYCLOHEXANE; BIOACCUMULATION; LACTATION; PESTICIDE RESIDUES; METABOLISM; Jan, J. 1983 Bulletin of Environmental Contamination and Toxicology 30:595-599				

Tissue	Cases Exposure Route	Range	Mean	General Information
8839 Adipose				Review. Residues detected in various foods and human tissues. Data used to determine dietary intakes.
REVIEW; ADIPOSE TISSUE; MILK; CONSUMER EXPOSURE; ENVIRONMENTAL EXPOSURE; UNITED KINGDOM; INFANTS; CHLOROBENZENES; HEXACHLOROBENZENE; FISHES; FOOD CONTAMINATION; PESTICIDE RESIDUES; METABOLITES; AGRICULTURE Peattie, M.E.; Lindsay, D.G.; Hoodless, R.A. 1984 Science of the Total Environment 34:73-86				

Tissue	Cases Exposure Route	Range	Mean	General Information
8840 Milk, fat	13	Not given	128 ug/kg	3-5 days postpartum. 9-10/81. Mothers in Ljubljana Maternity Clinic, Yugoslavia GLC

(next page)

Benzene, 1,2,3-trichloro-
87-61-6
C6-H3-Cl3
MW 181.46, MP 52.6 C, BP 221 C, VP 1 mm Hg at 40 C

(continued)

Tissue	Cases Exposure Route	Range	Mean	General Information
8841 Milk, whole	12	2-10 ug/kg	5 ug/kg	3-5 days postpartum. 9-10/81. Mothers in Ljubljana Maternity Clinic, Yugoslavia GLC
ADIPOSE TISSUE; MILK; ENVIRONMENTAL EXPOSURE; YUGOSLAVIA; AUTOPSIES; CHLOROBENZENES; HEXACHLOROCYCLOHEXANE; BIOACCUMULATION; LACTATION; PESTICIDE RESIDUES; METABOLISM; Jan, J. 1983 Bulletin of Environmental Contamination and Toxicology 30:595-599				

Benzene, 1,2,3,4-tetrachloro-
634-66-2
C6-H2-Cl4
MW 215.90, MP 47.5 C, BP 254 C at 760 mm Hg, VP 1 mm at 66.5 C

Tissue	Cases Exposure Route	Range	Mean	General Information
8842 Adipose	15	Not detected-1 ug/kg	1 ug/kg	Investigation of residues in autopsy samples. Fat basis. 20-60 yr old traffic accident victims, 1975-80. Ljubljana and Maribor hospitals, Yugoslavia GLC
8843 Milk, fat	12	Not given	25 ug/kg	3-5 days postpartum. 9-10/81. Mothers in Ljubljana Maternity Clinic, Yugoslavia GLC
8844 Milk, whole	12	Not detected-3 ug/kg	1 ug/kg	3-5 days postpartum. 9-10/81. Mothers in Ljubljana Maternity Clinic, Yugoslavia GLC
ADIPOSE TISSUE; MILK; ENVIRONMENTAL EXPOSURE; YUGOSLAVIA; AUTOPSIES; CHLOROBENZENES; HEXACHLOROCYCLOHEXANE; BIOACCUMULATION; LACTATION; PESTICIDE RESIDUES; METABOLISM; Jan, J. 1983 Bulletin of Environmental Contamination and Toxicology 30:595-599				

Benzene, 1,2,3,5-tetrachloro-
634-90-2
C6-H2-Cl4
MW 215.90, MP 54.5 C, BP 246 C, VP 1 mm Hg at 56.2 C

Tissue	Cases Exposure Route	Range	Mean	General Information
8845 Adipose	a) 91 b) 84	a) Not detected-16 ng/g b) Not detected-3 ng/g	a) 1+/-2 ng/g b) 0.5+/-0.3 ng/g	a) Kingston b) Ottawa Single samples from greater omentum of each cadaver. Significantly different - frequency of occurrence was low, thus hard to assess how meaningful. In general, residue values in entire survey of 20 compounds slightly higher in Kingston. No significant differences by sex. 1,2,4,5-isomer had same GC retention time Autopsies, unembalmed cadavers, 11/79-1/81, Kingston, Ontario (a Great Lakes Community) and 11/80-1/81, Ottawa, Ontario (outside Great Lakes Basin), Canada. Age ranges 7-88 yr, 16-91 yr, respectively. GC/MS
ADIPOSE TISSUE; CANADA; AUTOPSIES; PESTICIDES; ENVIRONMENTAL EXPOSURE; CHLORINE ORGANIC COMPOUNDS; CHLOROBENZENES; WATER POLLUTION Williams, D.T.; LeBel, G.L.; Junkins, E. 1984 Journal of Toxicology and Environmental Health 13:19-29				

Tissue	Cases Exposure Route	Range	Mean	General Information
8846 Adipose	15	2-20 ug/kg	16 ug/kg	Investigation of residues in autopsy samples. Fat basis. May include 1,2,4,5-TeCB. 20-60 yr old traffic accident victims, 1979-80. Ljubljana and Maribor hospitals, Yugoslavia GLC
8847 Milk, fat	12	Not given	80 ug/kg	3-5 days postpartum. May also include 1,2,4,5-TeCB. 9-10/81. Mothers in Ljubljana Maternity Clinic, Yugoslavia GLC
8848 Milk, whole	12	Not detected-5 ug/kg	2 ug/kg	3-5 days postpartum. May include 1,2,4,5-TeCB. 9-10/81. Mothers in Ljubljana Maternity Clinic, Yugoslavia GLC
ADIPOSE TISSUE; MILK; ENVIRONMENTAL EXPOSURE; YUGOSLAVIA; AUTOPSIES; CHLOROBENZENES; HEXACHLOROCYCLOHEXANE; BIOACCUMULATION; LACTATION; PESTICIDE RESIDUES; METABOLISM; Jan, J. 1983 Bulletin of Environmental Contamination and Toxicology 30:595-599				

Benzene, 1,2,4-trichloro-
120-82-1
C6-H3-Cl3
MW 181.46, MP 17 C, BP 213 C, VP 1 mm Hg at 38.4 C

Tissue	Cases Exposure Route	Range	Mean	General Information
8640 Adipose	a) 91 b) 84	a) Not detected-653 ng/g b) Not detected-186 ng/g	a) 24+/-82 ng/g b) 7+/-20 ng/g	a) Kingston b) Ottawa Single samples from greater omentum of each cadaver. In general, residue values in entire survey of 20 compounds slightly higher in Kingston. No significant differences by sex Autopsies, unembalmed cadavers, 11/79-1/81, Kingston, Ontario (a Great Lakes Community) and 11/80-1/81, Ottawa, Ontario (outside Great Lakes Basin), Canada. Age ranges 7-88 yr, 16-91 yr, respectively. GC/MS
ADIPOSE TISSUE; CANADA; AUTOPSIES; PESTICIDES; ENVIRONMENTAL EXPOSURE; CHLORINE ORGANIC COMPOUNDS; CHLOROBENZENES; WATER POLLUTION Williams, D.T.; LeBel, G.L.; Junkins, E. 1984 Journal of Toxicology and Environmental Health 13:19-29				

Tissue	Cases Exposure Route	Range	Mean	General Information
8880 Adipose	15	2-15 ug/kg	9 ug/kg	Investigation of residues in autopsy samples. Fat basis. 20-60 yr old traffic accident victims, 1979-80. Ljubljana and Maribor hospitals, Yugoslavia GLC
8881 Milk, fat	12	Not given	25 ug/kg	3-5 days postpartum. 9-10/81. Mothers in Ljubljana Maternity Clinic, Yugoslavia GLC
8882 Milk, whole	12	Not detected-4 ug/kg	1 ug/kg	3-5 days postpartum. 9-10/81. Mothers in Ljubljana Maternity Clinic, Yugoslavia GLC
ADIPOSE TISSUE; MILK; ENVIRONMENTAL EXPOSURE; YUGOSLAVIA; AUTOPSIES; CHLOROBENZENES; HEXACHLOROCYCLOHEXANE; BIOACCUMULATION; LACTATION; PESTICIDE RESIDUES; METABOLISM; Jan, J. 1983 Bulletin of Environmental Contamination and Toxicology 30:595-599				

Benzene, 1,3,5-trichloro-
108-70-3
$C_6H_3Cl_3$
MW 181.46, MP 63.4 C, BP 208.4 C (also reported as 208.5 C), VP 10 mm Hg at 78 C

Tissue	Cases Exposure Route	Range	Mean	General Information
8853 Adipose	a) 91 b) 84	a) Not detected-22 ng/g b) Not detected-61 ng/g	a) 2+/-3 ng/g b) 4+/-10 ng/g	a) Kingston b) Ottawa Single samples from greater omentum of each cadaver. In general, residue values in entire survey of 20 compounds slightly higher in Kingston. No significant differences by sex Autopsies, unembalmed cadavers, 11/79-1/81, Kingston, Ontario (a Great Lakes Community) and 11/80-1/81, Ottawa, Ontario (outside Great Lakes Basin), Canada. Age ranges 7-88 yr, 16-91 yr, respectively. GC/MS

ADIPOSE TISSUE; CANADA; AUTOPSIES; PESTICIDES; ENVIRONMENTAL EXPOSURE; CHLORINE ORGANIC COMPOUNDS; CHLOROBENZENES; WATER POLLUTION
Williams, D.T.; LeBel, G.L.; Junkins, E. 1984 Journal of Toxicology and Environmental Health 13:19-29

Tissue	Cases Exposure Route	Range	Mean	General Information
8854 Adipose	15	8-20 ug/kg	16 ug/kg	Investigation of residues in autopsy samples. Fat basis. 20-60 yr old traffic accident victims, 1979-80. Ljubljana and Maribor hospitals, Yugoslavia GLC
8855 Milk, fat	12	Not given	25 ug/kg	3-5 days postpartum. 9-10/81. Mothers in Ljubljana Maternity Clinic, Yugoslavia GLC
8856 Milk, whole	12	Not detected-3 ug/kg	1 ug/kg	3-5 days postpartum. 9-10/81. Mothers in Ljubljana Maternity Clinic, Yugoslavia GLC

ADIPOSE TISSUE; MILK; ENVIRONMENTAL EXPOSURE; YUGOSLAVIA; AUTOPSIES; CHLOROBENZENES; HEXACHLOROCYCLOHEXANE; BIOACCUMULATION; LACTATION; PESTICIDE RESIDUES; METABOLISM;
Jan, J. 1983 Bulletin of Environmental Contamination and Toxicology 30:595-599

Benzenepropanamine, N-methyl-gamma-(4-(trifluoromethyl)phenoxy)-, (+-)-
54910-89-3
C17-H18-F3-N-O
MW 309.33

Tissue	Cases Exposure Route	Range	Mean	General Information
8857 Blood, plasma	25 Ingestion	a) 20.9-55.4 ng/ml b) 17.1-46.4 ng/ml c) 6.3-36.3 ng/ml d) 7.1-25.7 ng/ml	a) 39.3+/-9.6 ng/ml b) 28.7+/-6.4 ng/ml c) 20.7+/-10.7 ng/ml d) 19.1+/-5.6 ng/ml	a) Controls b) Patients c) Norfluoxetine, controls d) Norfluoxetine, patients Maximum concentrations at 5.0+/-1.7 hr (controls) and 4.4+/-2.3 hr (patients) for parent compound, and 76.0+/-16.1 hr (controls) and 71.7+/-95.2 hr (patients) for metabolite, after 40 mg. 6 controls, 19 patients with renal dysfunction (6 hemodialysis patients) GC
8858 Urine	19 Ingestion	a) 0.15-1.71 mg b) 0.15-1.26 mg c) 0.19-1.80 mg d) 0.42-1.79 mg	a) 0.47 mg b) 0.55 mg c) 0.68 mg d) 0.94 mg	a) Controls b) Patients c) Norfluoxetine, controls d) Norfluoxetine, patients Total amounts after 40 mg. 6 controls, 13 patients with renal dysfunction GC
BLOOD PLASMA; URINE; DELIBERATE EXPOSURE; ADULTS; KIDNEY DISEASES; DEPRESSION; ANTIDEPRESSIVE AGENTS; DRUG THERAPY; BIOACCUMULATION; BIOLOGICAL MONITORING; METABOLITES; DRUGS Aronoff, G.R.; Bergstrom, R.F.; Pottratz, S.T.; Sloan, R.S.; Wolen, R.L.; Lemberger, L. 1984 Clinical Pharmacology and Therapeutics 36(1):138-144				

Benzilic acid, 4,4'-dichloro-, ethyl ester (8 CI); Benzeneacetic acid, 4-chloro-alpha-(4-chlorophenyl)-alpha-hydroxy-, ethyl ester (9 CI)
510-15-6
C16-H14-Cl2-O3
MW 325, BP 148 C at 0.04 mm Hg

Tissue	Cases Exposure Route	Range	Mean	General Information
8859 Urine	10	a) 0.025-0.348 ppm b) 0.013-0.548 ppm c) 0.026-0.407 ppm d) 0.0-0.046 ppm	a) 0.162+/-0.081 ppm b) 0.172+/-0.053 ppm c) 0.133+/-0.041 ppm d) 0.021+/-0.006 ppm S.E.	a) 4/21/82, noon b) 4/22/82, noon c) 4/23/82 noon d) 4/26/82 after 2 d with no exposure Grove sprayed 4/19/82, 1.13 kgA1/acre. Levels correlated significantly with leaf residue and boxes of fruit picked. Levels also given for exposure pads pinned on workers. Citrus harvesters, Florida GC
URINE; OCCUPATIONAL EXPOSURE; FLORIDA; ADULTS; INSECTICIDES; METABOLITES; CHLORINE ORGANIC COMPOUNDS; OCCUPATIONAL HAZARDS; ORCHARDS; PESTICIDES Nigg, H.N.; Stamper, J.H.; Queen, R.M. 1984 American Industrial Hygiene Association Journal 45(3):182-186				

Benzoic acid, 3,6-dichloro-2-methoxy-
1918-00-9
C8-H6-Cl2-O3
MW 221.04, MP 114-116 C, VP 3.75X10(E-3) mm Hg at 100 C

Tissue	Cases Exposure Route	Range	Mean	General Information
8860 Bile	1 Ingestion	Not applicable	140 mg/L	Autopsy samples after unknown dose of Killex (a mixture of 100 g 2,4-D/L, 50 g mecoprop/L, 9 g dicamba/L). Death within approximately 5 hr. 61 yr old suicide victim with history of mental illness and chronic alcoholism Comatose, distress, low blood pressure, peculiar odor on breath, heavy breathing, distended abdomen, vomiting Elevated white cell count. At autopsy, large volume of blood in pleural cavity HPLC
8861 Blood	1 Ingestion	Not applicable	170 mg/L	Autopsy samples after unknown dose of Killex (a mixture of 100 g 2,4-D/L, 50 g mecoprop/L, 9 g dicamba/L). Death within approximately 5 hr. 61 yr old suicide victim with history of mental illness and chronic alcoholism Comatose, distress, low blood pressure, peculiar odor on breath, heavy breathing, distended abdomen, vomiting Elevated white cell count. At autopsy, large volume of blood in pleural cavity HPLC
8862 Liver	1 Ingestion	Not applicable	<100 mg/kg	Autopsy samples after unknown dose of Killex (a mixture of 100 g 2,4-D/L, 50 g mecoprop/L, 9 g dicamba/L). Death within approximately 5 hr. 61 yr old suicide victim with history of mental illness and chronic alcoholism Comatose, distress, low blood pressure, peculiar odor on breath, heavy breathing, distended abdomen, vomiting Elevated white cell count. At autopsy, large volume of blood in pleural cavity HPLC

DELIBERATE EXPOSURE; SUICIDE; AUTOPSIES; PESTICIDES; HERBICIDES; BLOOD; URINE; BILE; LIVER
Fraser, A.D.; Isner, A.F.; Perry, R.A. 1984 Journal of Forensic Sciences 29(4):1237-1241

Tissue	Cases Exposure Route	Range	Mean	General Information
8863 Urine				Review. General information, reported levels, sources of exposure, metabolites, and methods of analysis for: phthalate ester plasticizers, chlorophenoxy acid herbicides, chlorophenol biocides, p-nitrophenol, simple phenols, benzenediols, and toluene.

URINE; ENVIRONMENTAL EXPOSURE; OCCUPATIONAL EXPOSURE; DELIBERATE EXPOSURE; CONSUMER EXPOSURE; ADULTS; REVIEW; CARCINOMAS; POISONING; MEASUREMENT METHODS; PESTICIDES; INDUSTRIAL CHEMICALS; HERBICIDES; INSECTICIDES; FUNGICIDES; PENTACHLOROPHENOL; SOLVENTS; BENZENES; PHENOLS; INDUSTRIAL POLLUTION; TOLUENE; BLOOD; CARCINOGEN; METABOLISM; METABOLITES; WOOD PRESERVATIVES
Fatiadi, A.J. 1983 Priority Toxic Pollutants in Human Urine: Their Occurrence and Analysis, Aug. 1983, 60 p

BHC, total (No postings in CHEMLINE).
C6-H6-Cl6
MW 290.85

Tissue	Cases Exposure Route	Range	Mean	General Information
8864 Adipose	a) 43 b) 45 c) 92	a) Not given b) Not given c) Not given	a) 11.3 ppm b) 4.78 ppm c) 3.65 ppm	a) 1974 b) 1976 c) 1981 Levels higher in 40-60 yr olds than in 30 yr olds. Men higher than women. Use of organochlorine pesticides restricted for about 10 yr. 30->60 yr olds, Matsuyama City, Japan GC-EC
JAPAN; ADIPOSE TISSUE; ENVIRONMENTAL EXPOSURE; CHLORINE ORGANIC COMPOUNDS; DDT; HEPTACHLOROCYCLOHEXANE; HEXACHLOROBENZENE; POLYCHLORINATED BIPHENYLS; PESTICIDE RESIDUES; POPULATION EXPOSURE Mori, Y.; Kikuta, M.; Okinaga, E.; Okura, T. 1983 Bulletin of Environmental Contamination and Toxicology 30:74-79				

Tissue	Cases Exposure Route	Range	Mean	General Information
8865 Blood	36	a) 4.6-41.2 ppb b) 2.3-30.7 ppb c) 4.7-30.4 ppb d) 7.8-20.7 ppb	a) 18.3 ppb b) 17.3 ppb c) 13.6 ppb d) 14.8 ppb	a) Maternal, live births, 27 cases b) Maternal, stillbirths, 9 cases c) Cord, live births, 27 cases d) Cord, stillbirths, 9 cases Pregnant women, Lucknow, India GC-EC; TLC
INDIA; ADULTS; NEWBORN; BLOOD; PLACENTA; ALDRIN; CHLORINE ORGANIC COMPOUNDS; DDD; DDE; DDT; HEXACHLOROCYCLOHEXANE; LINDANE; BIOACCUMULATION; METABOLITES; PESTICIDE RESIDUES; POPULATION EXPOSURE; PREGNANCY; ENVIRONMENTAL EXPOSURE Saxena, M.C.; Siddiqui, M.K.J.; Agarwal, V.; Kuuty, D. 1983 Journal of Toxicology and Environmental Health 11:71-79				

Tissue	Cases Exposure Route	Range	Mean	General Information
8866 Blood, serum	a) 7 b) 8 c) 9 d) 7	a) Not given b) Not given c) Not given d) Not given	a) 7.97+/-4.51 ppb b) 6.42+/-6.40 ppb c) 8.48+/-7.84 ppb d) 4.94+/-6.57 ppb	a) Controls, normal 2nd trimester pregnancies, no missed abortions b) Low serum PCB, recent missed abortions (mean 1.62) c) High serum PCB, recent missed abortions (mean 1.50) d) Former missed abortions (mean 3.43) In missed abortions, products of conception were retained in utero at least 6 wk after fetal death, which occurred before week 20 of gestation. Women with missed abortions (mean age 28.1 yr for high PCB group) and controls (mean age 24.7 yr) GC
ADULTS; BLOOD SERUM; CHLORINE ORGANIC COMPOUNDS; DDD; DDE; DDT; DIELDRIN; HEPTACHLOR EPOXIDE; INSECTICIDES; LINDANE; PESTICIDES; POLYCHLORINATED BIPHENYLS; BIOACCUMULATION; PESTICIDE RESIDUES; PREGNANCY; ENVIRONMENTAL EXPOSURE Bercovici, B.; Wassermann, M.; Cucos, S.; Ron, M.; Wassermann, D.; Pines, A. 1983 Environmental Research 30:169-174				

BHC, total (No postings in CHEMLINE).
C6-H6-Cl6
MW 290.85

Tissue	Cases Exposure Route	Range	Mean	General Information
8867 Milk	a) 54 b) 102	a) Not detected b) Not detected-0.044 ppm	b) Not detected b) 0.023+/-0.017 ppm	a) Hawaii b) Mainland USA Sampled up to 1 mo postpartum. Lipid basis. Mean of positive residues. 1979-80 GC
HAWAII; UNITED STATES; ADULTS; MILK; ALDRIN; CHLORINATED HYDROCARBONS; CHLORINE ORGANIC COMPOUNDS; DDD; DDE; DDT; DIELDRIN; HEPTACHLOR EPOXIDE; HEPTACHLOROCYCLOHEXANE; HEXACHLOROBENZENE; LINDANE; NONACHLOR; OXYCHLORDANE; POLYCHLORINATED BIPHENYLS; PESTICIDE RESIDUES; POPULATION EXPOSURE; ENVIRONMENTAL EXPOSURE Tabei, G.H.; Kaushikuu, S.M.; Leong, G.H. 1988 Bulletin of Environmental Contamination and Toxicology 38:606-613				

Tissue	Cases Exposure Route	Range	Mean	General Information
8868 Milk	8	a) 0.12-0.15 mg/kg b) 0.028-0.081 mg/kg c) 0.037-0.040 mg/kg d) 0.030-0.036 mg/kg	a) 0.14+/-0.014 mg/kg b) 0.026+/-0.002 mg/kg c) 0.039+/-0.002 mg/kg d) Not given	a) Successive fractions, 1 nursing period, mother A b) Successive fractions, 1 nursing period, mother B c) Each nursing period for 24 hr, mother C d) Sample 1X/wk, 4 wk, mother C Fat basis GC
ADULTS; MILK; MEASUREMENT METHODS; PESTICIDES; POLYCHLORINATED BIPHENYLS; LACTATION; HEALTH HAZARDS; ENVIRONMENTAL EXPOSURE Noren, K. 1988 Archives of Environmental Contamination and Toxicology 12:277-288				

Tissue	Cases Exposure Route	Range	Mean	General Information
8869 Milk				Review. Chemicals found in occupational exposures are discussed in terms of milk partition factors, potential infant exposures and possible infant health effects.
LEAD; MERCURY; PESTICIDES; POLYCHLORINATED BIPHENYLS; OCCUPATIONAL HAZARDS; MILK; COMPARATIVE EVALUATIONS; REVIEW; CADMIUM; CHROMIUM; DDT; DIELDRIN; INFANTS Wolff, M.S. 1988 American Journal of Industrial Medicine 4:259-281				

Tissue	Cases Exposure Route	Range	Mean	General Information
8870 Placenta	a) 27 b) 9	a) 4.1-95.6 ppb b) 5.5-26.1 ppb	a) 17.1 ppb b) 13.4 ppb	a) Live births b) Stillbirths Pregnant women, Lucknow, India GC-EC; TLC
INDIA; ADULTS; NEWBORN; BLOOD; PLACENTA; ALDRIN; CHLORINE ORGANIC COMPOUNDS; DDD; DDE; DDT; HEXACHLOROCYCLOHEXANE; LINDANE; BIOACCUMULATION; METABOLITES; PESTICIDE RESIDUES; POPULATION EXPOSURE; PREGNANCY; ENVIRONMENTAL EXPOSURE Saxena, M.C.; Siddiqui, M.K.J.; Agarwal, V.; Kuuty, D. 1988 Journal of Toxicology and Environmental Health 11:71-79				

Biphenyl, chloro (8 Cl); 1,1'-Biphenyl, chloro derivs (9 Cl)
1336-36-3
EXACT COMPOSITION UNKNOWN OR UNDETERMINED

Tissue	Cases Exposure Route	Range	Mean	General Information
8871 Adipose	a) 18 b) 35 c) 14 d) 21	a) Not given b) Not given c) Not given d) Not given	a) 6.47+/-2.35 ppm b) 5.12+/-2.58 ppm c) 3.89+/-0.97 ppm d) 3.98+/-1.33 ppm	a) Cancer deaths, autopsies b) Noncancer deaths, autopsies c) Cancer patients, biopsies d) Noncancer patients, biopsies No significant differences. Accumulation in breast adipose apparently not related to the occurrence of mammary cancer. Autopsies, 48-82 yr old cancer victims, 15-85 yr old noncancer victims. Biopsies, 25-54 yr old cancer patients, 19-64 yr old noncancer patients. Denmark GC

ENVIRONMENTAL EXPOSURE; ADIPOSE TISSUE; DENMARK; AUTOPSIES; CARCINOMAS; BIOPSIES; POLYCHLORINATED BIPHENYLS; DDE
Unger, M.; Kiaer, H.; Blichert-Toft, M.; Olsen, J.; Clausen, J. 1984 Environmental Research 34:24-28

Tissue	Cases Exposure Route	Range	Mean	General Information
8872 Adipose	8, 2 controls	a) 880-2170 ug/kg b) 160, 180 ug/kg c) 0.5-1.0 ug/kg d) Not detected e) 0.7-1.0 ug/kg f) 0.05-0.2 ug/kg	a) 1340 ug/kg b) Not given c) 0.83 ug/kg d) Not detected e) 0.83 ug/kg f) Not given	a) PCB b) Controls c) Methylthio metabolite d) Controls e) Methylsulfone metabolite f) Controls Autopsy samples from Yusho patients and controls, Japan GC/MS; Mass fragmentography

PCB; LIVER; AUTOPSIES; LUNGS; ADIPOSE TISSUE; JAPAN; ENVIRONMENTAL EXPOSURE; BIOACCUMULATION; POLYCHLORINATED BIPHENYLS
Haraguchi, H.; Kuroki, H.; Masuda, Y.; Shigematsu, N. 1984 Food and Chemical Toxicology 22(4):283-288

Tissue	Cases Exposure Route	Range	Mean	General Information
8873 Adipose	a) 91 b) 84	a) 90-28,300 ng/g b) 450-4760 ng/g	a) 2950+/-3626 ng/g b) 2001+/-873 ng/g	a) Kingston b) Ottawa Single samples from greater omentum of each cadaver. Values for Kingston males/females significantly different. In general, residue values in entire survey of 20 compounds slightly higher in Kingston. Autopsies, unembalmed cadavers, 11/79-1/81, Kingston, Ontario (a Great Lakes Community) and 11/80-1/81, Ottawa, Ontario (outside Great Lakes Basin), Canada. Age ranges 7-88 yr, 16-91 yr, respectively. GC/MS

ADIPOSE TISSUE; CANADA; AUTOPSIES; PESTICIDES; ENVIRONMENTAL EXPOSURE; CHLORINE ORGANIC COMPOUNDS; CHLOROBENZENES; WATER POLLUTION
Williams, D.T.; LeBel, G.L.; Junkins, E. 1984 Journal of Toxicology and Environmental Health 13:19-29

Biphenyl, chloro (8 Cl); 1,1'-Biphenyl, chloro derivs (9 Cl)
1336-36-3
EXACT COMPOSITION UNKNOWN OR UNDETERMINED

Tissue	Cases Exposure Route	Range	Mean	General Information
8874 Adipose	105 Ingestion	Not given	a) 0.27+/-0.22 mg/kg b) 0.24+/-0.20 mg/kg c) 0.38+/-0.20 mg/kg d) 0.28+/-0.24 mg/kg e) 0.08+/-0.00 mg/kg f) 0.13+/-0.05 mg/kg g) 0.14+/-0.14 mg/kg h) 0.17+/-0.13 mg/kg i) 0.21+/- 0.21 mg/kg j) 0.24+/-0.18 mg/kg	a) Men, whole country b) Women, whole country c) Men, South Finland d) Women, South Finland e) Men, <=1 fish meal/mo f) Women <=1 fish meal/mo g) Men, 2-3 fish meals/mo h) Women, 2-3 fish meals/mo i) Men, >=4 fish meals/mo j) Women, >=4 fish meals/mo Hospital patients and accidental fatalities, 2 mo-91 yr old GC/MS

ADIPOSE TISSUE; ENVIRONMENTAL EXPOSURE; FINLAND; SEX; AGE; AUTOPSIES; BIOPSIES; CHLORINATED HYDROCARBONS; HEPTACHLOR EPOXIDE; HEXACHLOROBENZENE; DDT; POLYCHLORINATED BIPHENYLS; BIOACCUMULATION; BIOLOGICAL MONITORING; DIETS; FISHES; FOOD CONTAMINATION; HEALTH HAZARDS; POPULATION EXPOSURE

Mussalo-Rauhamaa, H.; Pyysalo, H.; Mollanen, R. 1984 Journal of Toxicology and Environmental Health 13:689-704

Tissue	Cases Exposure Route	Range	Mean	General Information
8875 Adipose	1 Ingestion	Not given	12.8 ppm Fat basis	PCB-poisoned patient, 10 mo after onset of poisoning. Most toxic PCB component in commercial preparation, 3,4,3',4'-tetrachlorobiphenyl was detected. Dec 1979-Sept 1980, central Taiwan GC

TAIWAN; DELIBERATE EXPOSURE; ACCIDENTAL POISONING; POLYCHLORINATED BIPHENYLS; BLOOD; POPULATION EXPOSURE; SKIN DISEASES; DERMATITIS; FOOD CONTAMINATION; CHLORINATED HYDROCARBONS; INDUSTRIAL CHEMICALS; HEALTH HAZARDS; ENVIRONMENTAL EXPOSURE

Chen, P.H.-S.; Luo, M.-L.; Weng, C.-K.; Chen, C.-J. 1984 American Journal of Industrial Medicine 5:133-145

Tissue	Cases Exposure Route	Range	Mean	General Information
8876 Adipose	a) 21 b) 45 c) 92	a) Not given b) Not given c) Not given	a) 5.43 ppm b) 4.17 ppm c) 3.02 ppm	a) 1973 b) 1976 c) 1981 Levels higher in 40-60 yr olds than in 40 yr olds. Men higher than women. Use of PCB has been restricted for about 10 yr. 30->60 yr olds, Matsuyama City, Japan GC-EC

JAPAN; ADIPOSE TISSUE; ENVIRONMENTAL EXPOSURE; CHLORINE ORGANIC COMPOUNDS; DDT; HEPTACHLOROCYCLOHEXANE; HEXACHLOROBENZENE; POLYCHLORINATED BIPHENYLS; PESTICIDE RESIDUES; POPULATION EXPOSURE

Mori, Y.; Kikuta, M.; Okinaga, E.; Okura, T. 1983 Bulletin of Environmental Contamination and Toxicology 30:74-79

Biphenyl, chloro (8 Cl); 1,1'-Biphenyl, chloro derivs (9 Cl)
1336-36-3
EXACT COMPOSITION UNKNOWN OR UNDETERMINED

Tissue	Cases Exposure Route	Range	Mean	General Information
8877 Adipose				Review of the relative toxicity of the individual congeners of PCBs and PCDFs identified in tissues of Yusho patients.

REVIEW; POLYCHLORINATED BIPHENYLS; ENVIRONMENTAL EXPOSURE; POLYCHLORINATED DIBENZOFURANS; ADIPOSE TISSUE; BLOOD, LIVER; JAPAN; TAIWAN
Masuda, Y.; Yoshimura, H. 1984 American Journal of Industrial Medicine 5:31-44

Tissue	Cases Exposure Route	Range	Mean	General Information
8878 Adipose	a) 1 b) 1 Ingestion Transplacental	a) Not given b) Not given	a) 0.83 ppm b) 0.02 ppm Whole base	a) Adult, died of respiratory failure (esophageal carcinoma) 12 yr 6 mo after onset of Yusho b) Infant, died from coiled umbilical cord. Mother had Yusho. 76 yr old male. Stillborn male infant. Kyushu, Japan Yusho lesions characteristic GC pattern Skin pigmentation, follicular hyperkeratosis, hyperplacia of duct epithelium in esophageal gland GC

JAPAN; ACCIDENTAL POISONING; ENVIRONMENTAL EXPOSURE; FOOD CONTAMINATION; AUTOPSIES; POLYCHLORINATED BIPHENYLS; ADULTS; INFANTS; LIVER; HEART; ADIPOSE TISSUE; SKIN DISEASES; DERMATITIS; CARCINOMAS; CHLORINATED HYDROCARBONS; INDUSTRIAL CHEMICALS; HEALTH HAZARDS; POPULATION EXPOSURE; TRANSPLACENTAL TRANSFER
Kikuchi, M. 1984 American Journal of Industrial Medicine 5:19-30

Tissue	Cases Exposure Route	Range	Mean	General Information
8879 Blood	16	a) Not given b) Not given c) Not given d) Not given e) Not given f) Not given g) Not given h) Not given	a) 2.1 ng b) 2.5 ng c) 2.1 ng d) 2.0 ng e) 1.5 ng f) 1.0 ng g) 3.1 ng h) 2.0 ng /g whole blood	a) 7 d after parturition b) 14 d c) 28 d d) 42 d e) 56 d f) 70 d g) 84 d H) 98 d Average of samples collected at each time period. No correlation between levels in milk and blood. No significant difference, f), g), and h) ($p<0.10$). Mothers, mean age 35+/-2 yr, mean wt 125+/-8 lb, National Capital Region, (Ottawa), Canada GC

BLOOD; MILK; ENVIRONMENTAL EXPOSURE; CANADA; ADULTS; PESTICIDES; POLYCHLORINATED BIPHENYLS; CHLORINE ORGANIC COMPOUNDS; LACTATION; PESTICIDE RESIDUES; DIELDRIN; DDT; DDE; OXYCHLORDANE; NONACHLOR; HEPTACHLOR EPOXIDE; HEXACHLOROBENZENE; BIOACCUMULATION
Mes, J.; Doyle, J.A.; Adams, B.R.; Davies, D.J.; Turton, D. 1984 Archives of Environmental Contamination and Toxicology 13:217-223

Biphenyl, chloro (8 Cl); 1,1'-Biphenyl, chloro derivs (9 Cl)
1336-36-3
EXACT COMPOSITION UNKNOWN OR UNDETERMINED

Tissue	Cases Exposure Route	Range	Mean	General Information
8880 Blood	a) 18 b) 8	a) 9-95 ppb b) 12-70 ppb	a) 29.0+/-25.2 ppb b) 42.0+/-22.4 ppb	a) C[illegible] b) [illegible] Annua[illegible]ples, 1975-1979, occupationally exposed mothers. Their children breast-fed as infants. Levels influenced by length of breast-feeding. Study focused on decrease and half-life of PCBs 1-13 yr olds, Japan GC

BIOLOGICAL MONITORING; BLOOD; AGE; OCCUPATIONAL EXPOSURE; ENVIRONMENTAL EXPOSURE; JAPAN; CHILDREN; LACTATION; ADULTS; POLYCHLORINATED BIPHENYLS; BIOACCUMULATION
Yakushiji, T.; Watanabe, I.; Kuwabara, K.; Tanaka, R.; Kashimoto, T.; Kunita, N.; Hara, I. 1984 Archives of Environmental Contamination and Toxicology 13: 341-345

Tissue	Cases Exposure Route	Range	Mean	General Information
8881 Blood	101	Not given	3.5+/-1.1 ng/g	Sampled on admission. Median, 3.2 ng/g. All cases had >0.01 ng/g. Over 50% total PCB residue accounted for by 6 congeners. Data indicate intake is on-going. 74 congeners analyzed to identify common contaminants and data given for 17. 26+/-6 yr olds, maternity facility admissions, urban and rural vicinity of Lake Ontario (Rochester and Oswego), and a mixed population from the Hudson River area (Albany), 1977, NY GC

BLOOD; FETAL BLOOD; ENVIRONMENTAL EXPOSURE; NEW YORK; COMPARATIVE EVALUATIONS; HEXACHLOROBENZENE; DDE; POLYCHLORINATED BIPHENYLS; BIOACCUMULATION; POPULATION EXPOSURE; TRANSPLACENTAL TRANSFER; PESTICIDE RESIDUES
Bush, B.; Snow, J.; Koblintz, R. 1984 Archives of Environmental Contamination and Toxicology 13:517-527

Tissue	Cases Exposure Route	Range	Mean	General Information
8882 Blood	a) 85 b) 45 Ingestion	a) 0-40 ppb b) 41->100 ppb	a) Not given b) Not given	a) Milder ocular manifestation b) Severe 100% occurrence of edematous swelling of upper conjunctival pigmentation, and swollen cystic Meibomian glands in b). Consumed contaminated rice oil. 7-68 yr olds, 46 males, 84 females, referred for study to Veterans General Hospital, Taiwan, Oct 1979-March 1980. Visual abnormalities and eye discomfort (blurred vision, eyestrain, burning sensation). Profuse discharge from eye, swelling and pigmentation of upper lids, abnormal pigmentation of conjunctivae, hypersecretion and swelling of Meibomian glands GC-EC

TAIWAN; POLYCHLORINATED BIPHENYLS; ACCIDENTAL POISONING; ENVIRONMENTAL EXPOSURE; BLOOD; POPULATION EXPOSURE; FOOD CONTAMINATION; CHLORINATED HYDROCARBONS; INDUSTRIAL CHEMICALS; HEALTH HAZARDS; DELIBERATE EXPOSURE
Fu, Y.-A. 1984 American Journal of Industrial Medicine 5:127-132

Biphenyl, chloro (8 Cl); 1,1'-Biphenyl, chloro derivs (9 Cl)
1336-36-3
EXACT COMPOSITION UNKNOWN OR UNDETERMINED

Tissue	Cases Exposure Route	Range	Mean	General Information
8883 Blood	8 Ingestion	a) 10-26 ppb b) 19-38 ppb c) 14-39 ppb d) 17-45 ppb	a) Not given b) Not given c) Not given d) Not given	a) 1st day of fast, 8 cases b) 7th day, 8 cases c) 9th day, 5 cases d) 5-7 day after fast, 8 cases Fasting with fluids/vitamins for 7-10 d. Wt after fast 40.5-66.5 kg (mean loss 4.85 kg). 26-35 mo after contaminated rice oil poisoning. Fasting improved all symptoms except cysts and abscesses and caused other side effects. 26-68 yr olds, 2 males, 6 females, 46-73.5 kg, ht 150-169 cm, May 1981, Taiwan Headache, dizziness, pain in sole of foot, cough, weakness, eye discharge, fatigue, excessive phlegm Acneiform eruptions, lumbago, arthralgia, nail and skin pigmentation, numbness GC-EC; GC/MS

TAIWAN; POLYCHLORINATED BIPHENYLS; ACCIDENTAL POISONING; ENVIRONMENTAL EXPOSURE; DIETS; DERMATITIS; NEUROLOGIC MANIFESTATIONS; BIOACCUMULATION; FOOD CONTAMINATION; POPULATION EXPOSURE; METABOLISM; BLOOD; SKIN DISEASES; HEALTH HAZARDS; CHLORINATED HYDROCARBONS; INDUSTRIAL CHEMICALS
Imamura, M.; Tung, T.-C. 1984 American Journal of Industrial Medicine 5:147-153

Tissue	Cases Exposure Route	Range	Mean	General Information
8884 Blood				Review of occupational exposure of workers to PCBs, PCQs, and PCDFs. Health status and blood levels of exposed workers were compared with those of Yusho patients.

REVIEW; OCCUPATIONAL EXPOSURE; POLYCHLORINATED BIPHENYLS; POLYCHLORINATED QUARTERPHENYLS; BLOOD; BLOOD PLASMA; CHILDREN; ADULTS; ENVIRONMENTAL EXPOSURE; COMPARATIVE EVALUATIONS; POLYCHLORINATED DIBENZOFURANS
Takamatsu, M.; Oki, M.; Maeda, K.; Inoue, Y.; Hirayama, H.; Yoshizuka, K. 1984 American Journal of Industrial Medicine 5:59-68

Tissue	Cases Exposure Route	Range	Mean	General Information
8885 Blood				Review of incidence and epidemiology of PCB poisoning from contaminated rice oil in Taiwan in 1979-80.

BLOOD; TAIWAN; POLYCHLORINATED BIPHENYLS; ENVIRONMENTAL EXPOSURE; ACCIDENTAL POISONING; ADOLESCENTS; ADULTS; AGE; SEX; REVIEW
Hsu, S.-T.; Ma, C.-I.; Hsu, S.K.-H.; Wu, S.-S.; Hsu, N.H.-M.; Yeh, C.-C. 1984 American Journal of Industrial Medicine 5:71-79

Tissue	Cases Exposure Route	Range	Mean	General Information
8886 Blood				Review of the relative toxicity of the individual congeners of PCBs and PCDFs identified in tissues of Yusho patients.

REVIEW; POLYCHLORINATED BIPHENYLS; ENVIRONMENTAL EXPOSURE; POLYCHLORINATED DIBENZOFURANS; ADIPOSE TISSUE; BLOOD; LIVER; JAPAN; TAIWAN
Masuda, Y.; Yoshimura, H. 1984 American Journal of Industrial Medicine 5:31-44

Biphenyl, chloro (8 Cl); 1,1'-Biphenyl, chloro deriva (9 Cl)
1336-36-3
EXACT COMPOSITION UNKNOWN OR UNDETERMINED

Tissue	Cases Exposure Route	Range	Mean	General Information
8887 Blood	95 Ingestion	a) 10.5-80.7 ppb b) 22.8-62.0 ppb c) 10.5-80.7 ppb d) Not given e) 14.6-68.0 ppb f) 10.5-80.7 ppb	a) 34.1 ppb b) 37.7 ppb c) 34.6 ppb d) <4 ppb e) 36.4 ppb f) 37.9 ppb	a) 31 who consumed contaminated rice oil mid 1978-beginning 1979, neurologic manifestations b) 4 without neurologic manifestations c) Patients in a) + b), d) 44 controls at hospital e) 6 poisoned cases, some outpatients, abnormal EEG f) 21 poisoned cases, normal EEG No relationship between levels and neurologic manifestations. 13-60 yr old males, females source is out patients, admitted Jan-Nov 1980 to Veterans General Hospital, Taiwan. Poor appetite, nausea, vomiting, general fatigue, neurologic manifestations Hypersecretion from eye, black comedo, acriform eruptions, pigmentation of lips, eyelids, gingivae, and nails. Nerve conduction velocities slowed. Peripheral neuropathy, dizziness, abnormal EEG. GC

TAIWAN; POLYCHLORINATED BIPHENYLS; ENVIRONMENTAL EXPOSURE; ACCIDENTAL POISONING; HEALTH HAZARDS; CHLORINATED HYDROCARBONS; POPULATION EXPOSURE; NEUROLOGIC MANIFESTATIONS; BLOOD; CEREBROSPINAL FLUID; FOOD CONTAMINATION

Chia, L.G.; Chu, P.L. 1984 American Journal of Industrial Medicine 5:117-126

Tissue	Cases Exposure Route	Range	Mean	General Information
8888 Blood	255 Ingestion Dermal Inhalation	a) Not given b) Not given c) Not given d) Not given e) Not given f) Not given g) Not given	a) 42+/-17 ppb b) 6+/-4 ppb c) 45+/-49 ppb d) 19+/-11 ppb e) 2+/-1 ppb f) 51+/-24 g) 20+/-16	a) 67 Taiwanese consumed contaminated rice oil, 1 yr post exposure b) 56 Japanese consumed contaminated rice oil, 11 yr post exposure c) 69 Japanese workers charging PCBs into condensers in factory d) 3 Japanese workers reclaiming PCBs used as heat exchangers e) 60 unexposed Japanese f) 6 Taiwanese females, 0.5 yr post exposure g) Same 6 Taiwanese females, 2 yr post exposure PCBs alone do not appear to cause clinical manifestations associated with poisoning. Taiwanese students, sampled 1979-81. Japanese victims of Yusho, sampled 1979. Japanese occupationally exposed in factories, sampled 1979-81. Unexposed healthy Japanese, sampled 1979-80 Contaminated rice oil disease or Yusho-type lesions. GC; GC/MS

TAIWAN; JAPAN; ACCIDENTAL POISONING; ENVIRONMENTAL EXPOSURE; OCCUPATIONAL EXPOSURE; HEALTH HAZARDS; FOOD CONTAMINATION; BLOOD; POLYCHLORINATED BIPHENYLS; CHLORINATED HYDROCARBONS; COMPARATIVE EVALUATIONS; POLYCHLORINATED QUARTERPHENYLS; POPULATION EXPOSURE; INDUSTRIAL CHEMICALS

Kunita, N.; Kashimoto, T.; Miyata, H.; Fukushima, S.; Hori, S.; Obana, H. 1984 American Journal of Industrial Medicine 5:45-58

Biphenyl, chloro (8 Cl); 1,1'-Biphenyl, chloro derivs (9 Cl)
1336-36-3
EXACT COMPOSITION UNKNOWN OR UNDETERMINED

Tissue	Cases Exposure Route	Range	Mean	General Information
8880 Blood	134 Ingestion	71.4-116.7 ppb	Not given	Patients chronically poisoned by consuming contaminated rice bran oil. No association between severity of clinical manifestations and blood levels. Patients from Tai-Chung prefecture in special clinics at Provincial Tai-Chung Hospital and National Taiwan University, Taiwan Headaches, dizziness, cough, poor appetite, weakness or swelling of limbs, abnormal menstruation, pruritus, hyperhidrosis of palms and soles Hypersecretion and swelling of eyelids and meibomish glands, pigmentation of mucosa and skin, follicular lesions with secondary bacterial infection, comedones, acneiform eruptions, external genital

TAIWAN; ACCIDENTAL POISONING; ENVIRONMENTAL EXPOSURE; HEALTH HAZARDS; POLYCHLORINATED BIPHENYLS; CHLORINATED HYDROCARBONS; BLOOD; INDUSTRIAL CHEMICALS; FOOD CONTAMINATION
Lu, Y.-C.; Wong, P.-N. 1984 American Journal of Industrial Medicine 5:81-115

Tissue	Cases Exposure Route	Range	Mean	General Information
8880 Blood	165 Ingestion	a) 10-720 ppb b) Not given	a) 38 ppb b) 39 ppb	a) Sampled 9-18 mo after onset of intoxication from contaminated rice-bran oil b) Sampled 10 mo after onset 29 patients with 10-19 ppb, 57 with 20-29 ppb, 39 with 30-39 ppb, 14 with 40-49 ppb, 22 with 50-100 ppb and 4 over 100 ppb. Most toxic PCB component in commercial preparation, 3,4,3',4'-tetrachlorobiphenyl was detected in b). Patients at Veterans General Hospital, Taipei, Taiwan, and homes Dec 1979-Sept 1980, central Taiwan Dermatitis, ocular abnormalities Acneiform eruptions, pigmentation of the skin, eye discharge, swelling of upper lids GC-EC; GC/MC

TAIWAN; DELIBERATE EXPOSURE; ACCIDENTAL POISONING; POLYCHLORINATED BIPHENYLS; BLOOD; POPULATION EXPOSURE; SKIN DISEASES; DERMATITIS; FOOD CONTAMINATION; CHLORINATED HYDROCARBONS; INDUSTRIAL CHEMICALS; HEALTH HAZARDS; ENVIRONMENTAL EXPOSURE
Chen, P.H.-S.; Luo, M.-L.; Wong, C.-K.; Chen, C.-J. 1984 American Journal of Industrial Medicine 5:133-145

Biphenyl, chloro (8 Cl); 1,1'-Biphenyl, chloro derivs (9 Cl)
1336-36-3
EXACT COMPOSITION UNKNOWN OR UNDETERMINED

Tissue	Cases Exposure Route	Range	Mean	General Information
8851 Blood	a) 6 b) 10 c) 9 d) 15 e) 9 f) 12 Ingestion Dermal Inhalation	a) Not given b) Not given c) Not given d) Not given e) Not given f) Not given	a) 44.2+/-29.7 ppb b) 4.6+/-4.1 ppb c) 38.7+/-22.8 ppb d) 10.2+/-5.5 ppb e) 24.0+/-14.1 ppb f) 42.4+/-36.0 ppb	a) Nonbreast-feeding mothers, exposed 9.8+/-5.1 yr b) Children of a), 4.6+/-3.7 yr old c) Mothers, breast-feeding 0-1 mo. Breast/bottle-5 mo. Exposed 8.9+/-2.7 yr d) Children of c), 4.3+/-2.2 yr old e) Mothers, breast-feeding >/= 3 mo. Exposed 8.6+/-3.0 yr f) Children of e) 5.5+/-3.8 yr old Data also given for individuals. Occupationally exposed mothers and their children, Japan. Sampled annually, 11/75-79 Some children had red eye, itchy skin, fever, carious teeth, decaying nails, pigmentation, mottled enamel GC
BLOOD; OCCUPATIONAL EXPOSURE; ENVIRONMENTAL EXPOSURE; JAPAN; CHILDREN; ADULTS; POLYCHLORINATED BIPHENYLS; INDUSTRIAL PLANTS; LACTATION Yakushiji, T.; Watanabe, I.; Kuwabara, K.; Tanaka, R.; Kashimoto, T.; Kunita, N.; Hara, I. 1984 Archives of Environmental Health 38(5):368-375				

Tissue	Cases Exposure Route	Range	Mean	General Information
8892 Blood				Review of clinical signs and symptoms of Yusho patients in Japan 1968-1978.
POLYCHLORINATED BIPHENYLS; POLYCHLORINATED QUARTERPHENYLS; ACCIDENTAL POISONING; REVIEW; JAPAN; BLOOD; ENVIRONMENTAL EXPOSURE Okumura, M. 1984 American Journal of Industrial Medicine 5:13-18				

Tissue	Cases Exposure Route	Range	Mean	General Information
8893 Blood, fetal	97 Transplacental	Not given	2.4+/-1.0 ng/g	Collected at delivery. Median, 1.0 ng/g. All cases had >0.01 ng/g. Over 50% total PCB residue accounted for by 6 congeners. Data indicate intake is on-going. 74 congeners analysed to identify common contaminants and data given for 17 Fetuses, delivered in urban and rural vicinity of Lake Ontario (Rochester and Oswego), and a mixed population from the Hudson River area (Albany), 1977, NY GC
BLOOD; FETAL BLOOD; ENVIRONMENTAL EXPOSURE; NEW YORK; COMPARATIVE EVALUATIONS; HEXACHLOROBENZENE; DDE; POLYCHLORINATED BIPHENYLS; BIOACCUMULATION; POPULATION EXPOSURE; TRANSPLACENTAL TRANSPER; PESTICIDE RESIDUES Bush, B.; Snow, J.; Koblintz, R. 1984 Archives of Environmental Contamination and Toxicology 13:517-527				

Biphenyl, chloro (8 Cl); 1,1'-Biphenyl, chloro derivs (9 Cl)
1336-36-3
EXACT COMPOSITION UNKNOWN OR UNDETERMINED

Tissue	Cases Exposure Route	Range	Mean	General Information
8894 Blood, plasma				Review of occupational exposure of workers to PCBs, PCQs, and PCDFs. Health status and blood levels of exposed workers were compared with those of Yusho patients.

REVIEW; OCCUPATIONAL EXPOSURE; POLYCHLORINATED BIPHENYLS; POLYCHLORINATED QUARTERPHENYLS; BLOOD; BLOOD PLASMA; CHILDREN; ADULTS; ENVIRONMENTAL EXPOSURE; COMPARATIVE EVALUATIONS; POLYCHLORINATED DIBENZOFURANS
Takamatsu, M.; Oki, M.; Maeda, K.; Inoue, Y.; Hirayama, H.; Yoshizuka, K. 1984 American Journal of Industrial Medicine 5:59-68

Tissue	Cases Exposure Route	Range	Mean	General Information
8895 Blood, serum		a) 1.1-14.3 ng/mL b) 0.1-7.2 ng/mL	a) 4.7 ng/mL b) 2.0 ng/mL	a) Maternal serum, 196 cases b) Cord serum, 196 cases 1-16 wk post partum. Significantly higher level in a) ($p<.001$) may reflect higher lipid level. Significant transfer to fetus. Mothers with easy access to contaminated Lake Michigan sports fish. Western Michigan GC

BLOOD SERUM; MILK; PLACENTA; ENVIRONMENTAL EXPOSURE; MICHIGAN; POLYCHLORINATED BIPHENYLS; POLYBROMINATED BIPHENYLS; LACTATION; TRANSPLACENTAL TRANSFER; BIOACCUMULATION
Jacobson, J.L.; Fein, G.G.; Jacobson, S.W.; Schwartz, P.M.; Dowler, J.K. 1984 American Journal of Public Health 74:378-379

Tissue	Cases Exposure Route	Range	Mean	General Information
8896 Blood, serum	16 Inhalation Dermal	a) Not given b) Not given	a) 6.4 +or- 2.3 ppb b) 7.5 +or- 6.8 ppb	a) Workers b) Controls 21-57 yr old exposed workers and controls, hog processing plant, with accidentally punctured transformer, Billings, MT GC

POLYCHLORINATED BIPHENYLS; FOODS; HEALTH HAZARDS; INDUSTRIAL PLANTS; INDUSTRIAL POLLUTION; LACTATION; MILK; MONTANA; ADULTS; BLOOD SERUM; ENVIRONMENTAL EXPOSURE
Drotman, D.P.; Baxter, P.J.; Liddle, J.A.; Brokopp, C.D.; Skinner, M.D. 1983 American Journal of Public Health 73(2):200-202

Biphenyl, chloro (8 Cl); 1,1'-Biphenyl, chloro derivs (9 Cl)
1336-36-3
EXACT COMPOSITION UNKNOWN OR UNDETERMINED

Tissue	Cases Exposure Route	Range	Mean	General Information
8897 Blood, serum	a) 7 b) 8 c) 9 d) 7	a) 12.2-40.0 ppb b) 10.9-42.8 ppb c) 60.9-166.2 ppb d) 45.3-109.1 ppb	a) 20.69 +or- 8.22 ppb b) 26.20 +or- 11.60 ppb c) 103.04 + or- 37.58 ppb d) 82.00 +or- 21.40 ppb	a) Controls, normal 2nd trimester pregnancies, no missed abortions b) Low serum PCB, recent missed abortions (mean 1.62) c) High serum PCB, recent missed abortions (mean 1.50) d) Former missed abortions (mean 3.48) In missed abortions, products of conception are retained in utero at least 6 weeks after fetal deaths, which occurred before week 20 of gestation. Groups c) and d) significantly different from a) ($p<0.0001$). Women with missed abortions (mean age 28.1 yr for high PCB group) and controls (mean age 24.7 yr) GC

ADULTS; BLOOD SERUM; CHLORINE ORGANIC COMPOUNDS; DDD; DDE; DDT; DIELDRIN; HEPTACHLOR EPOXIDE; INSECTICIDES; LINDANE; PESTICIDES; POLYCHLORINATED BIPHENYLS; BIOACCUMULATION; PESTICIDE RESIDUES; PREGNANCY; ENVIRONMENTAL EXPOSURE

Bercovici, B.; Wassermann, M.; Cucos, S.; Ron, M.; Wassermann, D.; Pines, A. 1983 Environmental Research 30:169-174

Tissue	Cases Exposure Route	Range	Mean	General Information
8898 Blood, serum	242 Ingestion		a) 5.5+/-3.7 ng/ml b) 2.5+/-1.9 ng/ml	a) Maternal levels b) Cord levels Mothers ate 6.7+/-5.8 Kg/yr contaminated Lake Michigan fish. Infants born 7/80-12/81 and their mothers Lower birth weight, decreased head circumference shortened gestational age GC

BLOOD SERUM; ENVIRONMENTAL EXPOSURE; ADULTS; NEWBORN; POLYCHLORINATED BIPHENYLS; FOOD CONTAMINATION; TRANSPLACENTAL TRANSFER

Fein, G.G.; Jacobson, J.L.; Jacobson, S.W.; Schwartz, P.M.; Dowler, J.K. 1984 Journal of Pediatrics 150(2):315-320

Tissue	Cases Exposure Route	Range	Mean	General Information
8899 Cerebrospinal Fluid	4 Ingestion	a) 0.5-2.3 ppb b) Not given	a) Not given b) <2.6 ppb	a) Consumed contaminated rice oil mid 1978-beginning 1979, with neurologic manifestations b) Controls, cerebral vascular disease patients Range of means. Blood levels of 48-68 ppb in a) indicated low penetration of blood-brain barrier. 14-15 yr old males, female, admitted Jan-Nov 1980, Veterans General Hospital, Taiwan Poor appetite, nauses, vomiting, general fatigue, neurologic manifestations Hypersecretion from eye, black comedo, acriform eruptions, pigmentation of lips, eyelids, gingival, and nails. Nerve conduction velocities slowed. Peripheral neuropathy, dizziness, abnormal EEG. GC

TAIWAN; POLYCHLORINATED BIPHENYLS; ENVIRONMENTAL EXPOSURE; ACCIDENTAL POISONING; HEALTH HAZARDS; CHLORINATED HYDROCARBONS; POPULATION EXPOSURE; NEUROLOGIC MANIFESTATIONS; BLOOD; CEREBROSPINAL FLUID; FOOD CONTAMINATION

Chia, L.G.; Chu, F.L. 1984 American Journal of Industrial Medicine 5:117-126

Biphenyl, chloro (8 Cl); 1,1'-Biphenyl, chloro derivs (9 Cl)
1336-36-3
EXACT COMPOSITION UNKNOWN OR UNDETERMINED

Tissue	Cases Exposure Route	Range	Mean	General Information
8900 Heart	a) 1 b) 1 Ingestion Transplacental	a) Not given b) Not given	a) 0.73 ppm b) 0.03 ppm Whole base	a) Adult, died of respiratory failure (esophageal carcinoma) 12 yr 6 mo after onset of Yusho b) Infant, cause of death uncertain, ventricular septal defect, mother had Yusho 6 yr 6 mo. 76 yr old male. Stillborn female infant. Kyushu, Japan Yusho lesions characteristic GC pattern Skin pigmentation, follicular hyperkeratosis, multiplication of duct epithelium in esophageal gland GC
JAPAN; ACCIDENTAL POISONING; ENVIRONMENTAL EXPOSURE; FOOD CONTAMINATION; AUTOPSIES; POLYCHLORINATED BIPHENYLS; ADULTS; INFANTS; LIVER; HEART; ADIPOSE TISSUE; SKIN DISEASES; DERMATITIS; CARCINOMAS; CHLORINATED HYDROCARBONS; INDUSTRIAL CHEMICALS; HEALTH HAZARDS; POPULATION EXPOSURE; TRANSPLACENTAL TRANSFER Kikuchi, M. 1984 American Journal of Industrial Medicine 5:19-30				

Tissue	Cases Exposure Route	Range	Mean	General Information
8901 Liver	3, 2 controls	a) 26-100 ug/kg b) 9 and 56 ug/kg c) 0.1-0.5 ug/kg d) Not detected e) 0.3-0.7 ug/kg f) 0.04 and 0.05 ug/kg	a) 5.76 ug/kg b) Not applicable c) 0.36 ug/kg d) Not detected e) 0.46 ug/kg f) Not applicable	a) PCB b) Controls c) Methylthio metabolite d) Controls e) Methylsulfone metabolite f) Controls Autopsy samples from Yusho patients and controls, Japan GC/MS; GC/MF
PCB; LIVER; AUTOPSIES; LUNGS; ADIPOSE TISSUE; JAPAN; ENVIRONMENTAL EXPOSURE; BIOACCUMULATION; POLYCHLORINATED BIPHENYLS Haraguchi, H.; Kuroki, H.; Masuda, Y.; Shigematsu, N. 1984 Food and Chemical Toxicology 22(4)283-288				

Tissue	Cases Exposure Route	Range	Mean	General Information
8902 Liver	a) 1 b) 1 c) 1 Ingestion Transplacental	a) Not given b) Not given	a) 0.19 ppm b) 0.07 ppm c) 0.02 ppm	a) Adult, died of respiratory failure (esophageal carcinoma) 12 yr 6 mo after onset of Yusho b) Infant, died from coiled umbilical cord. Mother had Yusho c) Infant, cause of death uncertain, ventricular septal defect, mother had Yusho 6 yr 6 mo. 76 yr old male. Stillborn male and female infants. Kyushu, Japan Yusho lesions. GC pattern characteristic of Yusho Skin pigmentation, follicular hyperkeratosis, multiplication of duct epithelium in esophageal gland GC
JAPAN; ACCIDENTAL POISONING; ENVIRONMENTAL EXPOSURE; FOOD CONTAMINATION; AUTOPSIES; POLYCHLORINATED BIPHENYLS; ADULTS; INFANTS; LIVER; HEART; ADIPOSE TISSUE; SKIN DISEASES; DERMATITIS; CARCINOMAS; CHLORINATED HYDROCARBONS; INDUSTRIAL CHEMICALS; HEALTH HAZARDS; POPULATION EXPOSURE; TRANSPLACENTAL TRANSFER Kikuchi, M. 1984 American Journal of Industrial Medicine 5:19-30				

Biphenyl, chloro (8 Cl); 1,1'-Biphenyl, chloro derivs (9 Cl)
1336-36-3
EXACT COMPOSITION UNKNOWN OR UNDETERMINED

Tissue	Cases Exposure Route	Range	Mean	General Information
8908 Liver				Review of the relative toxicity of the individual congeners of PCBs and PCDFs identified in tissues of Yusho patients.
REVIEW; POLYCHLORINATED BIPHENYLS; ENVIRONMENTAL EXPOSURE; POLYCHLORINATED DIBENZOFURANS; ADIPOSE TISSUE; BLOOD; LIVER; JAPAN; TAIWAN Masuda, Y.; Yoshimura, H. 1984 American Journal of Industrial Medicine 5:31-44				

Tissue	Cases Exposure Route	Range	Mean	General Information
8904 Lung	8, 2 controls	a) 18-66 ug/kg b) 7, 18 ug/kg c) 0.2-1.4 ug/kg d) 0.05, 0.07 ug/kg e) 1.0-2.5 ug/kg f) 0.2, 0.9 ug/kg	a) 46.6 ug/kg b) Not given c) 0.66 ug/kg d) Not given e) 1.5 ug/kg f) Not given	a) PCB b) Controls c) Methylthio metabolite d) Controls e) Methylsulfone metabolite f) Controls Autopsy samples from Yusho patients and controls, Japan GC/MS; GC/MF
PCB; LIVER; AUTOPSIES; LUNGS; ADIPOSE TISSUE; JAPAN; ENVIRONMENTAL EXPOSURE; BIOACCUMULATION; POLYCHLORINATED BIPHENYLS Haraguchi, H.; Kuroki, H.; Masuda, Y.; Shigematsu, N. 1984 Food and Chemical Toxicology 22(4):283-288				

Tissue	Cases Exposure Route	Range	Mean	General Information
8906 Milk	188 Ingestion	5.4-65.1 ng/mL	19.3 ng/mL	Mothers, 1-16 wk post partum, with easy access to contaminated Lake Michigan sports fish Western Michigan GC
BLOOD SERUM; MILK; PLACENTA; ENVIRONMENTAL EXPOSURE; MICHIGAN; POLYCHLORINATED BIPHENYLS; POLYBROMINATED BIPHENYLS; LACTATION; TRANSPLACENTAL TRANSFER; BIOACCUMULATION Jacobson, J.L.; Fein, G.G.; Jacobson, S.W.; Schwartz, P.M.; Dowler, J.K. 1984 American Journal of Public Health 74:378-379				

Tissue	Cases Exposure Route	Range	Mean	General Information
8906 Milk				Review. Levels after occupational exposures to trace metals, solvents, and halogenated hydrocarbons, discussed in terms of milk partition factors, potential infant exposures, possible health effects.
MILK; ENVIRONMENTAL EXPOSURE; ADULTS; REVIEW; MERCURY; LEAD; DDT; DIELDRIN; POLYCHLORINATED BIPHENYLS; POLYBROMINATED BIPHENYLS; CHROMIUM; CADMIUM; HEPTACHLOR EPOXIDE; OXYCHLORDANE; BIOACCUMULATION; LACTATION; HEALTH HAZARDS Wolff, M.S. 1983 American Journal of Industrial Medicine 4:259-281				

Biphenyl, chloro (8 CI); 1,1'-Biphenyl, chloro deriva (9 CI)
1336-36-3
EXACT COMPOSITION UNKNOWN OR UNDETERMINED

Tissue	Cases Exposure Route	Range	Mean	General Information
8907 Milk	16	a) Not given b) Not given c) Not given d) Not given e) Not given f) Not given g) Not given h) Not given	a) 25.3 ng b) 29.7 ng c) 25.6 ng d) 23.6 ng e) 25.9 ng f) 22.8 ng g) 23.4 ng h) 26.1 ng /g whole milk	a) 7 d after parturition b) 14 d c) 28 d d) 42 d e) 56 d f) 70 d g) 84 d H) 98 d Average of samples collected at each time period. No correlation between levels in milk and blood. Accumulation of residue in infant body fat theoretically estimated to increase rapidly during 1st 3 mo of breastfeeding, eventually equal to or greater than adult levels. p,p'-DDE and PCB levels highly correlated (95% confidence level, r = 0.791) Mothers, mean age 35+/-3 yr, mean wt 126+/-8 lb, National Capital Region, (Ottawa), Canada GC

BLOOD; MILK; ENVIRONMENTAL EXPOSURE; CANADA; ADULTS; PESTICIDES; POLYCHLORINATED BIPHENYLS; CHLORINE ORGANIC COMPOUNDS; LACTATION; PESTICIDE RESIDUES; DIELDRIN; DDT; DDE; OXYCHLORDANE; NONACHLOR; HEPTACHLOR EPOXIDE; HEXACHLOROBENZENE; BIOACCUMULATION
Mes, J.; Doyle, J.A.; Adams, B.R.; Davies, D.J.; Turton, D. 1984 Archives of Environmental Contamination and Toxicology 13:217-228

Tissue	Cases Exposure Route	Range	Mean	General Information
8908 Milk				Review. Chemicals found in occupational exposures are discussed in terms of milk partition factors, potential infant exposures and possible infant health effects.

LEAD; MERCURY; PESTICIDES; POLYCHLORINATED BIPHENYLS; OCCUPATIONAL HAZARDS; MILK; COMPARATIVE EVALUATIONS; REVIEW; CADMIUM; CHROMIUM; DDT; DIELDRIN; INFANTS
Wolff, M.S. 1983 American Journal of Industrial Medicine 4:259-281

Tissue	Cases Exposure Route	Range	Mean	General Information
8909 Milk	a) 54 b) 102	a) 0.13-2.3 ppm b) 0.076-4.4 ppm	a) 0.80+/-0.43 ppm b) 0.97+/-0.59 ppm	a) Hawaii b) Mainland USA Sampled up to 1 mo postpartum. Lipid basis. 1979-80 GC

HAWAII; UNITED STATES; ADULTS; MILK; ALDRIN; CHLORINATED HYDROCARBONS; CHLORINE ORGANIC COMPOUNDS; DDD; DDE; DDT; DIELDRIN; HEPTACHLOR EPOXIDE; HEPTACHLOROCYCLOHEXANE; HEXACHLOROBENZENE; LINDANE; NONACHLOR; OXYCHLORDANE; POLYCHLORINATED BIPHENYLS; PESTICIDE RESIDUES; POPULATION EXPOSURE; ENVIRONMENTAL EXPOSURE
Takei, G.H.; Kanahinua, S.M.; Leong, G.H. 1983 Bulletin of Environmental Contamination and Toxicology 30:606-613

Biphenyl, chloro (8 Cl); 1,1'-Biphenyl, chloro derivs (9 Cl)
1336-36-3
EXACT COMPOSITION UNKNOWN OR UNDETERMINED

Tissue	Cases Exposure Route	Range	Mean	General Information
8910 Milk	a) 20 b) 20 c) 20 d) 20 e) 20	a) 0.93-1.38 mg/kg fat b) 0.82-1.80 mg/kg fat c) 0.88-1.43 mg/kg fat d) 0.91-1.34 mg/kg fat e) 1.22-2.00 mg/kg fat	a) 1.07+/-0.10 mg/kg b) 1.06+/-0.25 mg/kg c) 1.18+/-0.15 mg/kg d) 1.07+/-0.11 mg/kg e) 1.44+/-0.18 mg/kg Fat basis	a) Umea, north coast b) Osterund, middle c) Stockholm, east coast d) Gothenburg, west coast e) Lund, south Range of 15 samples from mothers in each area. Samples pooled, milk collected 3-5 days postpartum. Levels in Lund significantly different (p=0.01) from other areas. 1977-79, Sweden GC-EC
SWEDEN; MILK; DDE; DDT; DIELDRIN ; HEXACHLOROCYCLOHEXANE; HEXACHLOROBENZENE; POLYCHLORINATED BIPHENYLS; AGRICULTURE; INDUSTRIAL AREAS; LACTATION; PESTICIDE RESIDUES; POPULATION EXPOSURE; ENVIRONMENTAL EXPOSURE Noren, K. 1988 Ambio 12(1):44-46				

Tissue	Cases Exposure Route	Range	Mean	General Information
8911 Milk	3	a) 0.71-0.79 mg/kg b) 0.33-0.46 mg/kg c) 0.57-0.61 mg/kg d) 0.56-0.57 mg/kg	a) 0.765+/-0.037 mg/kg b) 0.43+/-0.028 mg/kg c) 0.59+/-0.015 mg/kg d) Not given	a) Successive fractions, 1 nursing period, mother A b) Successive fractions, 1 nursing period, mother B c) Each nursing period for 24 hr, mother C d) Sample 1X/wk for 4 wk, mother C Fat basis GC
ADULTS; MILK; MEASUREMENT METHODS; PESTICIDES; POLYCHLORINATED BIPHENYLS; LACTATION; HEALTH HAZARDS; ENVIRONMENTAL EXPOSURE Noren, K. 1983 Archives of Environmental Contamination and Toxicology 12:277-283				

Tissue	Cases Exposure Route	Range	Mean	General Information
8912 Milk, fat	100	250-2560 ug/kg fat	540 ug/kg fat	Sampled 2 wk-3 mo postpartum. 63% had <500 ug/kg fat, 25% had <1000 ug/kg fat. Possible trend related to where mothers were born. Mothers from Sweden, Poland, USSR, US had higher levels than those from Africa and Asia Lactating mothers, Jerusalem area
MILK; ENVIRONMENTAL EXPOSURE; ISRAEL; POLYCHLORINATED BIPHENYLS; LACTATION; FOOD CONTAMINATION; BIOACCUMULATION Weisenberg, E. 1984 Public Health Reports 99(5): 498-501				

Biphenyl, chloro (8 CI); 1,1'-Biphenyl, chloro derivs (9 CI)
1336-36-3
EXACT COMPOSITION UNKNOWN OR UNDETERMINED

Tissue	Cases Exposure Route	Range	Mean	General Information
8913 Milk, fat	a) 57 b) 4	a) 0.31-1.45 mg/kg fat b) 0.62-0.93 mg/kg fat	a) 0.81 mg/kg fat b) 0.70 mg/kg fat	a) Samples from Copenhagen (10), Naestved (8), Odense (11), Bornholm (10), Sonderborg (8), Aalborg (10). Foremilk and hindmilk collected May-Dec 1982, 4-113 days postpartum b) Pools of equal parts from 9 mothers, Copenhagen, Feb 1982 Levels similar in individual and pooled samples. No immediate health risk to infants. Mothers with normal, healthy babies, 10 with low wt babies, Denmark GC-EC
MILK; ENVIRONMENTAL EXPOSURE; DENMARK; COMPARATIVE EVALUATIONS; CHLORINATED HYDROCARBONS; CHLORINE ORGANIC COMPOUNDS; CHLOROBENZENES; DDE; DDT; DIELDRIN; HEXACHLOROCYCLOHEXANE; HEXACHLOROBENZENE; POLYCHLORINATED BIPHENYLS Andersen, J.R.; Orbaek, K. 1984 Ambio 13(4):266-268				

Tissue	Cases Exposure Route	Range	Mean	General Information
8914 Milk, whole	100	5.36-73.66 ug/kg	16.50 ug/kg	Sampled 2 wk-3 mo postpartum. 40% had <10 ug/kg whole milk, 84% had <20 ug/kg, 15% had <30 ug/kg. Possible trend related to where mothers were born. Mothers from Sweden, Poland, USSR, US had higher levels than those from Africa, Asia Lactating mothers, Jerusalem area
MILK; ENVIRONMENTAL EXPOSURE; ISRAEL; POLYCHLORINATED BIPHENYLS; LACTATION; FOOD CONTAMINATION; BIOACCUMULATION Weisenberg, E. 1984 Public Health Reports 99(5): 498-501				

Biphenyl, 2,3,3',4,4'-pentachloro- (8 CI); 1,1'-Biphenyl, 2,3,3',4,4'-pentachloro- (9 CI)
32598-14-4
C12-H5-Cl5
MW 316

Tissue	Cases Exposure Route	Range	Mean	General Information
8915 Blood				Review of the relative toxicity of the individual congeners of PCBs and PCDFs identified in tissues of Yusho patients.
REVIEW; POLYCHLORINATED BIPHENYLS; ENVIRONMENTAL EXPOSURE; POLYCHLORINATED DIBENZOFURANS; ADIPOSE TISSUE; BLOOD; LIVER; JAPAN; TAIWAN Masuda, Y.; Yoshimura, H. 1984 American Journal of Industrial Medicine 5:31-44				

Biphenyl, 2,3',4,4',5-pentachloro- (8 CI); 1,1'-Biphenyl, 2,3',4,4',5-pentachloro (9 CI)
31508-00-6
C12-H5-Cl5
MW 316

Tissue	Cases Exposure Route	Range	Mean	General Information
8916 Adipose	7 Ingestion	Not detectable-0.16 ppm	Not given	Subjects ate meat contaminated with PBBs and PCBs. Level of detection 0.001 ppm. Healthy volunteers, 20-30 yr old GC/MS
ADIPOSE TISSUE; ENVIRONMENTAL EXPOSURE; MICHIGAN; ADULTS; BIOPSIES; BROMINATED HYDROCARBONS; CHLORINATED HYDROCARBONS; DDT; DDE; DIELDRIN; FATS; LIPIDS; PESTICIDES; POLYBROMINATED BIPHENYLS; POLYCHLORINATED BIPHENYLS; ANIMAL FEEDS; ACCIDENTAL POISONING; AGRICULTURE; BIOACCUMULATION; BIOLOGICAL MONITORING; FIRE RETARDANTS; FOOD ADDITIVES; FOOD CONTAMINATION; HEALTH HAZARDS; MEAT; PESTICIDE RESIDUES; POPULATION EXPOSURE Schnare, D.W.; Ben, M.; Shields, M.G. 1984 Ambio 13(5-6):378-380				

Tissue	Cases Exposure Route	Range	Mean	General Information
8917 Blood				Review of the relative toxicity of the individual congeners of PCBs and PCDFs identified in tissues of Yusho patients.
REVIEW; POLYCHLORINATED BIPHENYLS; ENVIRONMENTAL EXPOSURE; POLYCHLORINATED DIBENZOFURANS; ADIPOSE TISSUE; BLOOD; LIVER; JAPAN; TAIWAN Masuda, Y.; Yoshimura, H. 1984 American Journal of Industrial Medicine 5:31-44				

Bismuth
7440-69-9
Bi
AtW 208.98, MP 271.5 C, BP 1579 C

Tissue	Cases Exposure Route	Range	Mean	General Information
8918 Cerebrospinal fluid	a) 10 b) 8 c) 8 d) 6 e) 3 f) 1 g) 1	a) Not given b) Not given c) Not given d) Not given e) Not given f) Not given g) Not given	a) 36.6+/-23.7 ug/l b) 34.4+/-34.0 ug/l c) 31.8+/-15.9 ug/l d) 41.2+/-14.0 ug/l e) 35.8+/-1.1 ug/l f) 34.3 ug/l g) 31.3 ug/l	a) Controls, non-neoplasmic diseases (hydrocephalus, etc.) b) Meningioma c) Craniopharyngioma d) Astrocytoma e) Medulloblastoma f) Pinealblastoma g) Chondrosarcoma b, c) Benign brain tumors, d-g) malignant brain tumors No significant differences. Patients, 18 men, 14 women, range of mean ages 4.6-55.0 yr, fasted 8-12 hr AAS
CEREBROSPINAL FLUID; SAUDI ARABIA; CARCINOMAS; NEOPLASMS; SARCOMAS; ALUMINUM; ANTIMONY; BISMUTH; CADMIUM; COPPER; GOLD; LEAD; SELENIUM; SILVER El-Yazigi, A.; Al-Saleh, I.; Al-Mefty, O. 1984 Clinical Chemistry 30:1358-1360				

Bromide
24959-67-9
Br^-
MW 79.90, MP -7.2 C, BP 58.78 C

Tissue	Cases Exposure Route	Range	Mean	General Information
8919 Blood, serum	2 Dermal	a) Not applicable b) Not applicable c) Not applicable d) Not applicable e) Not applicable f) Not applicable	a) 630 mg/L b) 24 mg/L c) 380 mg/L d) 500 mg/L e) 350 mg/L f) 136 mg/L	a) 2 hr after exposure, case 1 b) Postmortem c) 1 hr after exposure, case 2 d) 24 hr e) 48 hr f) Postmortem Normal levels <4 mg/L. Exposed 45 min (case 1) and 20-30 min (case 2) inside empty storage tank. Ethylene dibromide was 15-41 ppm, 20 hr after exposure. 31 yr old male worker (90 kg) and 46 yr old male supervisor (106 kg), fertiliser-pesticide storage facility, San Joaquin Valley, CA Metabolic acidosis, acute renal and hepatic failure and necrosis of skeletal muscle and other organs Colorimetry
BLOOD SERUM; SKIN; ADIPOSE TISSUE; BRAIN; OCCUPATIONAL EXPOSURE; CALIFORNIA; BROMIDE; PESTICIDES; INDUSTRIAL ACCIDENTS; INDUSTRIAL AREAS; INDUSTRIES; FUMES; HEALTH HAZARDS; OCCUPATIONAL HAZARDS; AUTOPSIES Lete, G.A.; Pond, S.M.; Osterloh, J.D.; Wade, R.L.; Becker, C.E. 1984 Journal of the American Medical Association 252(17):2426-2431				

Bromine
7726-95-6
Br_2
AtW 79.904, MP -7.25 C, BP 59.47 C, VP 1 mm Hg at -60 C, 10 mm Hg at -30 C

Tissue	Cases Exposure Route	Range	Mean	General Information
8920 Blood, plasma		a) Not given b) Not given c) Not given	a) 3.57+/-0.024 ug/mL b) 3.26+/-0.47 ug/mL c) 3.66+/-0.20 ug/mL	a) Insulin-treated diabetics b) Non-insulin-treated diabetics c) Control non-diabetics Collected after overnight fasting. Significant difference between b), c), and a), b). 18-78 yr olds, Oxford, England NA; AAS
BLOOD PLASMA; ENGLAND; DIABETES; METABOLISM; MINERAL METABOLISM; ALUMINUM; ANTIMONY; ARSENIC; BARIUM; BROMINE; CADMIUM; CALCIUM; CESIUM; CHROMIUM; COBALT; COPPER; IODINE; IRON; LEAD; MAGNESIUM; MANGANESE; MERCURY; MOLYBDENUM; NICKEL; RUBIDIUM; SCANDIUM; SELENIUM; SILVER; TIN; VANADIUM; ZINC Ward, N.I.; Pim, B. 1984 Biological Trace Element Research 6:469-487				

Tissue	Cases Exposure Route	Range	Mean	General Information
8921 Blood, serum	100	1.25-10.0 ug/mL	4.75+/-1.35 ug/mL	Technique developed for simultaneous determination of several elements. Also measured detection limits for other elements. X-ray fluores
MEASUREMENT METHODS; BLOOD SERUM; IRON;COPPER; ZINC; BROMINE; TRACE ELEMENTS Rastegar, F.; Maier, E.A.; Heimburger, R.; Christophe, C.; Ruch, C.; Leroy, M.J. 1984 Clinical Chemistry 30(8):1300-1303				

Bromine

7726-95-6
Br
AtW 79.904, MP -7.25 C, BP 59.47 C, VP 1 mm Hg at -60 C, 10 mm Hg at -30 C

Tissue	Cases Exposure Route	Range	Mean	General Information
8022 Breast	22	a) Not given b) Not given	a) 24.4+/-11.5 ug/g b) 23.4+/-10.7 ug/g	a) Normal tissue b) Neoplastic Dry wt, 3 samples, p=0.89 Patients with primary breast carcinoma, samples of normal and neoplastic tissue obtained at time of mastectomy X-ray fluores
BREAST; CALCIUM; VANADIUM; CHROMIUM; MANGANESE; IRON; NICKEL; COPPER; ZINC; ARSENIC; SELENIUM; BROMINE; RUBIDIUM; STRONTIUM; MOLYBDENUM; LEAD; MERCURY; NEOPLASMS Rizk, S.L.; Sky-Peck, H.H. 1984 Cancer Research 44:5390-5394				

Tissue	Cases Exposure Route	Range	Mean	General Information
8028 Hair	6	a) 0-20 ug/g b) 0-40 ug/g c) 8.5-31.5 ug/g d) 30-62 ug/g e) 0-13 ug/g f) 2-8 ug/g Estimated from figure	a) 9.5 ug/g b) 22 ug/g c) 25 ug/g d) 51 ug/g e) 11 ug/g f) 7.4 ug/g	a) 0-40 cm from scalp, 7 yr old female b) 0-40 cm from scalp, 4 yr old female c) 0-30 cm from scalp, 7 yr old female d) 0-18 cm from scalp, 3 yr old female e) 0-15 cm from scalp, 2 yr old male f) 0-65 cm from scalp, 40 yr old female Range from total length, mean from 1st 10 cm from scalp. Levels decreased with increasing distance from scalp. Japan NA
HAIR; ENVIRONMENTAL EXPOSURE; JAPAN; ADULTS; CHILDREN; COMPARATIVE EVALUATIONS; BROMINE; CALCIUM; CHLORINE; COPPER; IODINE; MAGNESIUM; MANGANESE; MERCURY; SELENIUM; ZINC; BIOINDICATORS Yukawa, M.; Suzuki-Yasumoto, M.; Tanaka, S. 1984 Science of the Total Environment 38:41-54				

Cadmium

7440-43-9
Cd
AtW 112.40, MP 321 C, BP 765 C, VP 1 mm Hg at 394 C, 10 mm Hg at 486 C

Tissue	Cases Exposure Route	Range	Mean	General Information
8024 Aorta	a) 8 b) 6 c) 7	a) 0.00-18 ppm b) 2.1-6 ppm c) Not given Dry wt	a) Not given b) Not given c) 2.1+/-0.96 ppm Dry wt	a) Sclerotic aorta from metal-workers b) Normal aorta from metal-workers c) Normal aorta from non metal-workers 45-66 yr old workers. Autopsies, Japan, 1976-1977. Employed 7-32 yr ES
AORTA; VERTEBRAE; BONES; ENVIRONMENTAL EXPOSURE; OCCUPATIONAL EXPOSURE; JAPAN; AUTOPSIES; CADAVERS; CARDIOVASCULAR DISEASES; MINERALS; BIOACCUMULATION; DIETS; FOODS; MINERAL DEPOSITS; CALCIUM; PHOSPHORUS; IRON; MAGNESIUM; ZINC; ALUMINUM; COPPER; CADMIUM; LEAD; NICKEL; VANADIUM; CHROMIUM; MANGANESE; SILICON; TIN; TITANIUM; STRONTIUM Terracke, H. 1984 Archives of Environmental Contamination and Toxicology 13:119-127				

Cadmium
7440-43-9
Cd
AtW 112.40, MP 321 C, BP 765 C, VP 1 mm Hg at 394 C, 10 mm Hg at 486 C

Tissue	Cases Exposure Route	Range	Mean	General Information
8926 Blood	102	<1-113 ug/l	Not given	Workers. 71 had <10 ug/L and 31 had 10 ug/L or greater. Stepwise discriminant analysis of 10 factors in relation to Cd levels. Most important work environment risk factors were: length of splice and local exhaust ventilation. Age, sex, exposure time and intensity, smoking, and brazing method were of less predictive importance. 10 ug/L or above in blood associated with air levels 20 ug/cu m or more (exposure limit in Sweden=20 ug/cu m) Study, part of Swedish Welding Project, of 17-66 yr old workers in 20 companies, brazing with Cd-containing hard solders for >10% of work day for at least 3 mo AAS
CADMIUM; BLOOD; OCCUPATIONAL EXPOSURE; SWEDEN; STATISTICS				
Lundberg, I.; Sjogren, B.; Haline, U.; Hedstrom, L.; Holgersson, M. 1984 American Industrial Hygiene Association Journal 45(6):353-359				

Tissue	Cases Exposure Route	Range	Mean	General Information
8926 Blood	94	<0.008-0.210 ug/dl	0.045+/-0.063 ug/dl	Umbilical cord blood. Blood Pb, maternal smoking, proximity of residence to auto traffic not statistically related to levels. Healthy babies, Boston, MA AAS
CADMIUM; BLOOD; UMBILICAL CORD; MASSACHUSETTS; ENVIRONMENTAL EXPOSURE				
Rabinowitz, M.; Finch, H. 1984 Environmental Research 34:120-122				

Tissue	Cases Exposure Route	Range	Mean	General Information
8927 Blood	a) 40 b) 40 c) 40	a) 0.10-1.15 ug/L b) 0.10-2.7 ug/L c) 0.10-1.33 ug/L	a) 0.38 ug/L b) 0.77 ug/L 0.24 ug/L Geometric mean	a) Women in labor b) Controls, non-pregnant women matched for age and area of residence c) Newborns of mothers in a) Never occupationally exposed 18-40 yr old healthy women and healthy newborns, Milan, Italy AAS; Carbon Rod Atomization
BLOOD; URINE; ENVIRONMENTAL EXPOSURE; ITALY; ADULTS; NEWBORN; CADMIUM; TRANSPLACENTAL TRANSFER				
Alessio, L.; Dell'orto, A.; Calzaferri, G.; Buscaglia, M.; Motta, G.; Rizzo, M. 1984 Science of the Total Environment 34:261-266				

Cadmium

7440-43-9
Cd
AtW 112.40, MP 321 C, BP 765 C, VP 1 mm Hg at 394 C, 10 mm H_b at 486 C

Tissue	Cases Exposure Route	Range	Mean	General Information
0026 Blood	a) 680 b) 96 c) 144	a) Not given b) Not given c) Not given	a) 6.46+/-4.25 ug/L b) 8.46+/-8.45 ug/L c) 8.50+/-3.53 ug/L	a) Active smelter workers b) Retirees and ex-employees of smelter c) Copper and gold miners, never employed in smelter Data also given for different job catagories of smelter workers. Findings indicate that exposure to Cd containing fumes and dust and cigarette smoking can independently contribute to blood Cd levels AAS
BLOOD; URINE; OCCUPATIONAL EXPOSURE; ADULTS; CADMIUM; LEAD; ARSENIC; INDUSTRIAL PLANTS; SMELTERS; ZINC ORGANIC COMPOUNDS Lilis, R.; Valciukas, J.A.; Weber, J.P.; Fischbein, A.; Nicholson, W.J.; Campbell, C.; Malkin, J.; Selikoff, I.J. 1984 Environmental Research 33:76-95				

Tissue	Cases Exposure Route	Range	Mean	General Information
0029 Blood	1 Inhalation	Not applicable	32 nmol (0.36 ug/100 ml)	Subject sampled 48 hr after smelting 182 kg Pb for 24 hr in enclosed environment, died 72 hr later. Normal levels are <10 nmol (<0.11 ug/100 ml). Healthy 36 yr old AAS
BLOOD; BRAIN; HEART; INTESTINES; KIDNEYS; LIVER; LUNGS; MUSCLES; SKIN; SPLEEN; STOMACH; URINE; ENVIRONMENTAL EXPOSURE; UNITED KINGDOM; ADULTS; AUTOPSIES; METAL POISONING; CADMIUM; LEAD; INHALATION Taylor, A.; Jackson, M.A.; Patil, D.; Burston, J.; Lee, H.A. 1984 British Medical Journal 288:1270-1271				

Tissue	Cases Exposure Route	Range	Mean	General Information
0030 Blood	281	a) 1-22 ppb b) 1-34 ppb	a) 7+/-4 ppb b) 9+/-6 ppb	a) Maternal, 106 cases b) Cord, 97 cases Significant positive correlation. Determinations over 5-yr period. Nagoya, Japan, 1974-1978. Maternal venous and umbilical cord blood, women experiencing normal deliveries. AAS
ZINC; MERCURY; METHYLMERCURY; LEAD; CADMIUM; MANGANESE; COPPER; IRON; JAPAN; BLOOD; PLACENTA; UMBILICAL CORD; METALS; ENVIRONMENTAL EXPOSURE Tsuchiya, H.; Mitani, K.; Kodama, K.; Nakata, T. 1984 Archives of Environmental Health 39(1):11-17				

Tissue	Cases Exposure Route	Range	Mean	General Information
0031 Blood	570	<0.2-6.5 ug/l	0.85+/-0.9 ug/l Geometric=0.61 ug/l Median=0.53ug/l	Randomly selected subjects. Statistical analysis (variables: smoking, occupation, place of residence and sex) also given. Smokers, higher levels 285 60-65 yr olds (146 men, 139 women), Cologne. 284 60-65 yr olds (140 men, 154 women), Meckenheim and Rheinbach, FRG AAS
BLOOD; CONSUMER EXPOSURE; ENVIRONMENTAL EXPOSURE; GERMANY; ADULTS; CADMIUM; LEAD; METALS; SMOKING; RURAL AREAS; URBAN AREAS; SEX Brockhaus, A.; Freier, I.; Ewers, U.; Jermann, E.; Dolgner, R. 1983 International Archives of Occupational and Environmental Health 52:167-175				

Cadmium
7440-43-9
Cd
AtW 112.40, MP 321 C, BP 765 C, VP 1 mm Hg at 394 C, 10 mm Hg at 486 C

Tissue	Cases Exposure Route	Range	Mean	General Information
8982 Blood		0.3-1.2 ng/ml	Not given	Nearly all of the results from all countries were in this range. Levels from database containing data on "normal" levels of 15 elements in 7 tissues/fluids. Data selected by 60 investigators in over 40 countries. Diet, environment both important in distribution of elements.
ZINC; COPPER; MANGANESE; SELENIUM; LEAD; CADMIUM; BLOOD; BLOOD SERUM; HAIR; MILK; BANGLADESH; INDIA; TURKEY; FINLAND; ITALY; NEW ZEALAND; GUATEMALA; CHILE; SWEDEN; HUNGARY; YUGOSLAVIA; POLAND; KENYA; EGYPT; SOUTH AFRICA; UNITED STATES; AUSTRALIA; GREECE; PAKISTAN; NIGERIA; PHILIPPINES; ZAIRE; THAILAND; CHINA; WYOMING; OHIO; CALIFORNIA; JAPAN; MEXICO; CANADA; ISRAEL; PERU; SPAIN; COMPARATIVE EVALUATIONS; BIOLOGICAL MONITORING; IRAN; DIETS; ENVIRONMENTAL EXPOSURE Iyengar, G.V. 1984 Science of the Total Environment 38:125-131				

Tissue	Cases Exposure Route	Range	Mean	General Information
8985 Blood	a) 140 b) 86 c) 214	a) Not given b) Not given c) Not given	a) 0.37+/-0.24 ug/L b) 0.57+/-0.37 ug/L c) 1.38+/-0.95 ug/L S.E.	a) Nonsmokers b) Exsmokers, stopped smoking at least 1 mo before blood sample c) Current smokers Dose-effect relationship between daily tobacco consumption and Cd levels in current smokers who inhale. b) significantly higher than a) France, 24-55 yr olds (mean 41.4 yr), no occupational exposures AAS
CADMIUM; BLOOD; ADULTS; SMOKING; FRANCE; TOBACCOS; DELIBERATE EXPOSURE; COMPARATIVE EVALUATIONS; INHALATION; CONSUMER EXPOSURE Moreau, T.; Lellouch, J.; Juguet, B.; Festy, B.; Orssaud, G.; Claude, J.R. 1988 Archives of Environmental Health 38(3):163-167				

Tissue	Cases Exposure Route	Range	Mean	General Information
8934 Blood	2 Inhalation	a) Not given b) Not given c) Not given d) Not given e) Not given	a) <0.2 ug/dl b) 1.87 ug/dl c) 4.66 ug/dl d) 0.50 ug/dl e) 1.30 ug/dl	a) Preemployment. 10/83. 44 yr old smoker (1/2 oz tobacco/d) b) Same worker, 1/17/84 c) 2/2/84 d) 7/84. In Cd free area since 2/2 e) Another worker, 2/21/84. Employed since 1974. Intermittent smoker. Factory workers
BLOOD; URINE; OCCUPATIONAL EXPOSURE; ADULTS; CADMIUM; FUMES; INDUSTRIAL PLANTS; OCCUPATIONAL HAZARDS Hughes, E.G. 1984 Lancet 2(8417/8):1467-1468				

Cadmium
7440-43-9
Cd
AtW 112.40, MP 321 C, BP 765 C, VP 1 mm Hg at 394 C, 10 mm Hg at 486 C

Tissue	Cases Exposure Route	Range	Mean	General Information
8955 Blood	535	Not given	2.2 ug/l	About 1.5 times levels in 3 areas in Belgium, which in turn has higher levels than some other countries. Control measures considered necessary at values >5 ug/l. 16-85 yr olds, Malta AAS
BLOOD; ENVIRONMENTAL EXPOSURE; CONSUMER EXPOSURE; OCCUPATIONAL EXPOSURE; MALTA; BELGIUM; CADMIUM; LEAD Bruaux, P.; Claeys-Thoreau, F.; Ducoffre, G.; Lafontaine, A.; Grech, A.; Vassallo, A. 1983 International Archives of Occupational and Environmental Health 53:119-125				

Tissue	Cases Exposure Route	Range	Mean	General Information
8956 Blood	44 Inhalation	Not given	40-240 ug.yr/l	6 workers had cumulative exposure exceeding 500 mg.h/cu m. 2 had developed renal dysfunction (B2 micoroglobulinuria), and had blood levels exceeding 200 ug.y/l. Blood levels are more reliable than exposure levels in predicting kidney damage. Workers exposed (since 1964) at a cadmium-copper alloy plant. Mean age 44 yrs
BLOOD; OCCUPATIONAL EXPOSURE; SWEDEN; ADULTS; KIDNEY DISEASES; CADMIUM; INDUSTRIAL ATMOSPHERES; INDUSTRIAL PLANTS; INHALATION; OCCUPATIONAL HAZARDS; OCCUPATIONAL DISEASES Rogenfelt, A.; Elinder, C.G.; Jarup, L. 1984 International Archives of Occupational and Environmental Health 55:43-48				

Tissue	Cases Exposure Route	Range	Mean	General Information
8957 Blood	a) 114 b) 131 c) 48 d) 54	a) 0.1-0.58 ug/dl b) 0.01-0.71 ug/dl c) 0.01-0.44 ug/dl d) 0.01-0.33 ug/dl	a) 0.12+/-0.11 ug/dl b) 0.10+/-0.09 ug/dl c) 0.10+/-0.10 ug/dl d) 0.07+/-0.06 ug/dl	a) Unexposed male factory workers b) Exposed male workers c) Unexposed female factory workers d) Exposed female workers. Levels considered within normal range. Exposure was to Hg vapor. Male and female factory workers, ages 30.9 and 29.9 yr, exposure durations 4.8 and 7 yr. Matched controls. Belgium AAS
MERCURY; BLOOD; URINE; OCCUPATIONAL EXPOSURE; SEX; BELGIUM; HEALTH HAZARDS; OCCUPATIONAL HAZARDS; INHALATION; LEAD; CADMIUM; ZINC; INDUSTRIAL ATMOSPHERES; BIOINDICATORS; NEUROLOGIC MANIFESTATIONS Roels, H.; Gennart, J.-P.; Lauwerys, R.; Buchet, J.-P.; Malchaire, J.; Bernard, A. 1984 American Journal of Industrial Medicine 7:45-71				

Cadmium

7440-43-9
Cd
AtW 112.40, MP 321 C, BP 765 C, VP 1 mm Hg at 394 C, 10 mm Hg at 486 C

Tissue	Cases Exposure Route	Range	Mean	General Information
8938 Blood				Review. Levels, body burdens, and health effects resulting from environmental, dietary, smoking and occupational exposures.

BLOOD; LUNGS; URINE; GASTROINTESTINAL TRACT; LIVER; KIDNEYS; HAIR; SWEAT; MILK; SALIVA; CONSUMER EXPOSURE; ENVIRONMENTAL EXPOSURE; OCCUPATIONAL EXPOSURE; BONE DISEASES; HYPERTENSION; KIDNEY DISEASES; NEOPLASMS; INDUSTRIAL DISEASES; METAL POISONING; RESPIRATORY DISEASES; REVIEW; CADMIUM; FUMES; HEALTH HAZARDS; INDUSTRIAL ATMOSPHERES; INHALATION; MINERAL METABOLISM; OCCUPATIONAL HAZARDS; SMOKING; TRANSPLACENTAL TRANSPER; WATER POLLUTION; FOOD CONTAMINATION

Hallenbeck, W.H. 1984 Experientia 40(2):136-142

Tissue	Cases Exposure Route	Range	Mean	General Information
8939 Blood	a) 143 b) 240 c) 200 d) 75 e) 100 f) 201 g) 200 h) 75 i) 207 j) 212 k) 180 l) 192	a) Not given b) Not given c) Not given d) Not given e) Not given f) Not given g) Not given h) Not given i) Not given j) Not given k) Not given l) Not given	a) 1.2+/-1.95 ug/l b) 0.9+/-2.10 ug/l c) 0.9+/-1.48 ug/l d) 0.8+/-1.55 ug/l e) 0.7+/-1.49 ug/l f) 0.5+/-2.30 ug/l g) 1.2+/-1.64 ug/l h) 0.7+/-4.65 ug/l i) 0.9+/-1.78 ug/l j) 0.5+/-3.27 ug/l k) 0.6+/-2.18 ug/l l) 0.9+/-3.43 ug/l Geometric means	a) Belgium, Brussels b) China, Beijing c) India, Ahmedabad d) India, Bangalore e) India, Calcutta f) Israel, Jerusalem g) Japan, Tokyo h) Mexico, Mexico City i) Peru, Lima j) Sweden, Stockholm k) United States, Baltimore l) Yugoslavia, Zagreb Mean levels in smokers about 4X nonsmokers. Elementary school teachers from urban areas. AAS

BELGIUM; CHINA; INDIA; ISRAEL; JAPAN; MARYLAND; MEXICO; PERU; SWEDEN; UNITED STATES; YUGOSLAVIA; ADULTS; AGE; AUTOPSIES; CHILDREN; SEX; BLOOD; KIDNEYS; COMPARATIVE EVALUATIONS; CADMIUM; LEAD ; METALS; BIOACCUMULATION; GASOLINE; POPULATION EXPOSURE; SMOKING; URBAN AREAS; ENVIRONMENTAL EXPOSURE

Friberg, L.; Vahter, M. 1983 Environmental Research 30:95-128

Tissue	Cases Exposure Route	Range	Mean	General Information
8940 Blood	a) 57 b) 54	a) Not given b) Not given	a) 10.5% b) 3.7%	a) % exposed workers with levels >10 ug/l b) % unexposed workers with levels >10 ug/l Exposed smelters, electroplaters, welders. Unexposed factory and mine workers. Australia NA

AUSTRALIA ; LIVER; BLOOD; URINE; IN VIVO ANALYSIS; CADMIUM; INDUSTRIAL AREAS; INDUSTRIAL POLLUTION; HEALTH HAZARDS; INDUSTRIAL PLANTS; SMELTERS; OCCUPATIONAL EXPOSURE

Baddele Thomas, B.J.; Thomas, B.W.; Summers, V. 1983 British Journal of Radiology 56:449-451

Cadmium

7440-43-9
Cd
AtW 112.40, MP 321 C, BP 765 C, VP 1 mm Hg at 394 C, 10 mm Hg at 486 C

Tissue	Cases Exposure Route	Range	Mean	General Information
5941 Blood	94	a) 0.28-4.44 ug/100 ml b) 0.57-2.89 ug/100 ml	a) 1.34+/-0.77 ug/100 ml b) 1.47+/-0.60 ug/100 ml	a) Normal beta2-microglobulinuria, 66 cases b) Increased beta2-microglobulinuria, 28 cases Correlation of Cd and exposure, metallothionein and beta2-microglobulin in urine discussed. Past and present workers, 37.7-65.6 yr, in two Belgian Cd smelters Renal dysfunction AAS

URINE; BLOOD; OCCUPATIONAL EXPOSURE; BELGIUM; ADULTS; KIDNEY DISEASES; COMPARATIVE EVALUATIONS; CADMIUM; INDUSTRIAL PLANTS

Roels, H.; Lauwerys, R.; Buchet, J.P.; Bernard, A.; Garvey, J.S.; Linton, H.J. 1983 International Archives of Occupational and Environmental Health 52:159-166

Tissue	Cases Exposure Route	Range	Mean	General Information
5942 Blood	2259	a) 2.02+/-1.51-4.26+/-1.53 b) 2.77+/-1.51-4.57+/-1.44 c) 2.44+/-1.49-3.36+/-1.54 d) 3.26+/-1.43-4.44 +/-1.48 e) 2.64+/-1.44-3.73+/-1.44 f) 4.40+/-1.64-4.11+/-1.3 ng/ml	a) 3.68+/-1.53 ng/ml b) 3.52+/-1.50 ng/ml c) 3.04+/-1.40 ng/ml d) 4.18+/-1.47 ng/ml e) 3.50+/-1.5 ng/ml f) 4.29+/-1.56 ng/ml	a) Males from 10 districts, 826 cases b) Females, same districts, 1433 cases c) Male non-smokers, 265 cases d) Male smokers, 459 cases e) Female non-smokers, 1274 cases f) Females smokers, 31 cases c-f), ranges of means according to age. Significant differences: c)&d), e)&f), c)&e) $p<0.01$. Additional data given. Adults, mostly farmers with no known occupational exposure to heavy metals, Japan AAS

BLOOD; ENVIRONMENTAL EXPOSURE; CONSUMER EXPOSURE; ADULTS; AGE; SEX; CADMIUM; METALS; SMOKING

Watanabe, T.; Koizumi, A.; Fujita, H.; Kumai, M.; Ikeda, M. 1983 Environmental Research 31:472-488

Tissue	Cases Exposure Route	Range	Mean	General Information
5943 Blood, cells				Review. Metabolism and toxicity under conditions of excessive acute or chronic exposure.

LIVER; LUNGS; GASTROINTESTINAL TRACT; ERYTHROCYTES; KIDNEYS; PANCREAS; THYROID GLANDS; SALIVARY GLANDS; URINE; LYMPHOCYTES; BLOOD; CONSUMER EXPOSURE; ENVIRONMENTAL EXPOSURE; OCCUPATIONAL EXPOSURE; BONE DISEASES; HYPERTENSION; KIDNEY DISEASES; NEOPLASMS; INDUSTRIAL DISEASES; METAL POISONING; RESPIRATORY DISEASES; REVIEW; CADMIUM; FUMES; HEALTH HAZARDS; INDUSTRIAL ATMOSPHERES; INHALATION; MINERAL METABOLISM; OCCUPATIONAL HAZARDS; SMOKING; WATER POLLUTION; FOOD CONTAMINATION

Bernard, A.; Lauwerys, R. 1984 Experientia 40(2):143-152

Cadmium
7440-43-9
Cd
AtW 112.40, MP 321 C, BP 765 C, VP 1 mm Hg at 394 C, 10 mm Hg at 486 C

Tissue	Cases Exposure Route	Range	Mean	General Information
8044 Blood, plasma		a) Not given b) Not given c) Not given	a) 0.0019+/-0.0005 ug/mL b) 0.0028+/-0.0010 ug/mL c) 0.0021+/-0.0004 ug/mL	a) Insulin-treated diabetics b) Non-insulin-treated diabetics c) Control non-diabetics Collected after overnight fasting. Significant difference between b), c), and a), b). 18-78 yr olds, Oxford, England NA; AAS
BLOOD PLASMA; ENGLAND; DIABETES; METABOLISM; MINERAL METABOLISM; ALUMINUM; ANTIMONY; ARSENIC; BARIUM; BROMINE; CADMIUM; CALCIUM; CESIUM; CHROMIUM; COBALT; COPPER; IODINE; IRON; LEAD; MAGNESIUM; MANGANESE; MERCURY; MOLYBDENUM; NICKEL; RUBIDIUM; SCANDIUM; SELENIUM; SILVER; TIN; VANADIUM; ZINC Ward, N.I.; Pim, B. 1986 Biological Trace Element Research 6:469-487				

Tissue	Cases Exposure Route	Range	Mean	General Information
8045 Blood, whole	a) 11 b) 12 Ingestion	a) 0.5-1.8 ug/l b) 0.2-1.2 ug/l	a) 0.86 ug/l b) 0.72 ug/l	a) Males b) Females Difference not significant Healthy, elderly, nonsmokers, 11 males, 12 females, age 60-85, England AAS
BLOOD SERUM; URINE; ENGLAND; CADMIUM; IRON; LEAD; DIETS; AGE; ENVIRONMENTAL EXPOSURE Bunker, V.W.; Lawson, M.S.; Delves, H.T.; Clayton, B.E. 1984 American Journal of Clinical Nutrition 39:803-808				

Tissue	Cases Exposure Route	Range	Mean	General Information
8046 Blood, whole	158	a) 0.1-0.8 b) 0.3-3.5 c) 0.1-1.6 d) 0.7-4.0 e) 0.2-1.2 f) 0.1-4.0 g) 0.3-0.8 h) 0.3-4.0 ug/l	a) 0.4+/-0.2 (median 0.3) b) 0.9+/-0.6 (median 0.6) c) Not given d) Not given e) 0.4+/-0.2 (median 0.4) f) 1.3+/-0.9 (median 1.0) ug/l	a) 18 males, 17 females, 6-12 yr old from capital city of Kiel (FRG) b) 19 males, 26 females, 18-64 yr old c) 32 nonsmokers from b) d) 13 smokers e) 12 males, 18 females, 7-16 yr old from North Sea island of Pellworm (FRG) f) 24 males, 29 females, 21-76 yr old g) 33 nonsmokers from f) h) 20 smokers Children less contaminated than adults in both regions. Levels significantly higher in smokers. AAS
BLOOD; CONSUMER EXPOSURE; ENVIRONMENTAL EXPOSURE; GERMANY; ADULTS; AGE; CHILDREN; SEX; COMPARATIVE EVALUATIONS; CADMIUM; SMOKING; POPULATION EXPOSURE; AIR POLLUTION Jessen, H.; Kruse, H.; Piechotowski, I. 1984 International Archives of Occupational and Environmental Health 54:45-54.				

Cadmium

7440-43-9
Cd
AtW 112.40, MP 321 C, BP 765 C, VP 1 mm Hg at 394 C, 10 mm Hg at 486 C

Tissue	Cases Exposure Route	Range	Mean	General Information
8047 Blood, whole	72 Inhalation	a) 0.07-0.44 ug b) 0.03-0.51 ug c) 0.04-0.36 ug d) 0.02-0.55 ug e) 0.02-0.36 ug f) 0.07-0.34 ug g) 0.03-0.31 ug h) 0.07-0.50 ug /100 ml	a) 0.19+/-0.11 ug b) 0.17+/-0.13 ug c) 0.18+/-0.09 ug d) 0.15+/-0.12 ug e) 0.12+/-0.11 ug f) 0.18+/-0.09 ug g) 0.14+/-0.10 ug h) 0.24+/-0.14 ug /100 ml	a) Controls, 0 wks, 27 cases b) Controls, 16 wks, 27 cases c) Vitamin C treatment, 0 wks, 25 cases d) Vitamin C treatment, 16 wks, 25 cases e) Controls, 0 wks, 10 cases f) Controls, 8 wks, 10 cases g) Zinc treatment, 0 wks, 10 cases h) Zn treatment, 8 wks, 10 cases Vitamin C dose was 1 g/d, 5 d/wk. Zinc as Zn glutamate dose was 60 mg/d, 5 d/wk. No significant difference between control and treatment groups. 21-64 yr old workers at primary Pb smelter, 0.5-42 years exposure AAS
BLOOD; URINE; OCCUPATIONAL EXPOSURE; ADULTS; LEAD POISONING; METAL POISONING; INDUSTRIAL MEDICINE; CADMIUM; LEAD; MERCURY; ZINC; BIOACCUMULATION; HEALTH HAZARDS; INDUSTRIAL ATMOSPHERES; INDUSTRIAL PLANTS; INHALATION; OCCUPATIONAL HAZARDS; VITAMINS; VITAMIN C Lauwerys, R.; Roels, H.; Buchet, J.-P.; Bernard, A.A.; Verhoeven, L.; Koninge, J. 1983 Journal of Occupational Medicine 25(9): 668-678				

Tissue	Cases Exposure Route	Range	Mean	General Information
8048 Blood, whole				Review. Metabolism and toxicity under conditions of excessive acute or chronic exposure.
LIVER; LUNGS; GASTROINTESTINAL TRACT; ERYTHROCYTES; KIDNEYS; PANCREAS; THYROID GLANDS; SALIVARY GLANDS; URINE; LYMPHOCYTES; BLOOD; CONSUMER EXPOSURE; ENVIRONMENTAL EXPOSURE; OCCUPATIONAL EXPOSURE; BONE DISEASES; HYPERTENSION; KIDNEY DISEASES; NEOPLASMS; INDUSTRIAL DISEASES; METAL POISONING; RESPIRATORY DISEASES; REVIEW; CADMIUM; FUMES; HEALTH HAZARDS; INDUSTRIAL ATMOSPHERES; INHALATION; MINERAL METABOLISM; OCCUPATIONAL HAZARDS; SMOKING; WATER POLLUTION; FOOD CONTAMINATION Bernard, A.; Lauwerys, R. 1984 Experientia 40(2):143-152				

Tissue	Cases Exposure Route	Range	Mean	General Information
8049 Bone	1	Not given	<4 ppm Dry wt	Lumbar vertebrae (n=5). Chromate plating worker, employed 7 yr, died at age 66, 30 yr after changing jobs ES
AORTA; VERTEBRAE; BONES; ENVIRONMENTAL EXPOSURE; OCCUPATIONAL EXPOSURE; JAPAN; AUTOPSIES; CADAVERS; CARDIOVASCULAR DISEASES; MINERALS; BIOACCUMULATION; DIETS; FOODS; MINERAL DEPOSITS; CALCIUM; PHOSPHORUS; IRON; MAGNESIUM; ZINC; ALUMINUM; COPPER; CADMIUM; LEAD; NICKEL; VANADIUM; CHROMIUM; MANGANESE; SILICON; TIN; TITANIUM; STRONTIUM Teraoka, H. 1984 Archives of Environmental Contamination and Toxicology 13: 119-127				

Cadmium
7440-43-9
Cd
AtW 112.40, MP 321 C, BP 765 C, VP 1 mm Hg at 394 C, 10 mm Hg at 486 C

Tissue	Cases Exposure Route	Range	Mean	General Information
8050 Brain	2	a) Not applicable b) Not applicable	a) 0.08 ppm b) 0.066 ppm	a) Healthy 36 yr old man died about 5 days after smelting 182 kg lead for 24 hr in enclosed environment b) Control, 60 yr old man without renal disease Autopsies. AAS

BLOOD; BRAIN; HEART; INTESTINES; KIDNEYS; LIVER; LUNGS; MUSCLES; SKIN; SPLEEN; STOMACH; URINE; ENVIRONMENTAL EXPOSURE; UNITED KINGDOM; ADULTS; AUTOPSIES; METAL POISONING; CADMIUM; LEAD; INHALATION

Taylor, A.; Jackson, M.A.; Patil, D.; Burston, J.; Lee, H.A. 1984 British Medical Journal 288:1270-1271

Tissue	Cases Exposure Route	Range	Mean	General Information
8051 Cerebrospinal fluid	a) 10 b) 8 c) 3 d) 6 e) 3 f) 1 g) 1	a) Not given b) Not given c) Not given d) Not given e) Not given f) Not given g) Not given	a) 1.5+/-1.8 ug/l b) 1.3+/-1.3 ug/l c) 0.1+/-0.1 ug/l d) 4.0+/-3.1 e) 1.9+/-2.7 ug/l f) 4.0 ug/l g) 1.3 ug/l	a) Controls, non-neoplasmic diseases (hydrocephalus, etc.) b) Meningioma c) Craniopharyngioma d) Astrocytoma e) Medulloblastoma f) Pinealblastoma g) Chondrosarcoma b, c) Benign brain tumors, (d-g) malignant brain tumors No significant differences. Patients, 18 men, 14 women, range of mean ages 4.6-55.0 yr, fasted 8-12 hr AAS

CEREBROSPINAL FLUID; SAUDI ARABIA; CARCINOMAS; NEOPLASMS; SARCOMAS; ALUMINUM; ANTIMONY; BISMUTH; CADMIUM; COPPER; GOLD; LEAD; SELENIUM; SILVER

El-Yazigi, A.; Al-Saleh, I.; Al-Mefty, O. 1984 Clinical Chemistry 30:1358-1360

Tissue	Cases Exposure Route	Range	Mean	General Information
8052 Gastrointestinal tract				Review. Levels, body burdens, and health effects resulting from environmental, dietary, smoking and occupational exposures.

BLOOD; LUNGS; URINE; GASTROINTESTINAL TRACT; LIVER; KIDNEYS; HAIR; SWEAT; MILK; SALIVA; CONSUMER EXPOSURE; ENVIRONMENTAL EXPOSURE; OCCUPATIONAL EXPOSURE; BONE DISEASES; HYPERTENSION; KIDNEY DISEASES; NEOPLASMS; INDUSTRIAL DISEASES; METAL POISONING; RESPIRATORY DISEASES; REVIEW; CADMIUM; FUMES; HEALTH HAZARDS; INDUSTRIAL ATMOSPHERES; INHALATION; MINERAL METABOLISM; OCCUPATIONAL HAZARDS; SMOKING; TRANSPLACENTAL TRANSFER; WATER POLLUTION; FOOD CONTAMINATION

Hallenbeck, W.H. 1984 Experientia 40(2):136-142

Cadmium

7440-43-9
Cd
AtW 112.40, MP 321 C, BP 765 C, VP 1 mm Hg at 394 C, 10 mm Hg at 486 C

Tissue	Cases Exposure Route	Range	Mean	General Information
8953 Gastrointestinal tract				Review. Metabolism and toxicity under conditions of excessive acute or chronic exposure.

LIVER; LUNGS; GASTROINTESTINAL TRACT; ERYTHROCYTES; KIDNEYS; PANCREAS; THYROID GLANDS; SALIVARY GLANDS; URINE; LYMPHOCYTES; BLOOD; CONSUMER EXPOSURE; ENVIRONMENTAL EXPOSURE; OCCUPATIONAL EXPOSURE; BONE DISEASES; HYPERTENSION; KIDNEY DISEASES; NEOPLASMS; INDUSTRIAL DISEASES; METAL POISONING; RESPIRATORY DISEASES; REVIEW; CADMIUM; FUMES; HEALTH HAZARDS; INDUSTRIAL ATMOSPHERES; INHALATION; MINERAL METABOLISM; OCCUPATIONAL HAZARDS; SMOKING; WATER POLLUTION; FOOD CONTAMINATION

Bernard, A.; Lauwerys, R. 1984 Experientia 40(2):143-152

Tissue	Cases Exposure Route	Range	Mean	General Information
8954 Hair	a) 32 b) 35 c) 52 d) 44	a) 0.16-9.89 ppm b) 0.06-9.65 ppm c) 0.02-1.48 ppm d) 0.01-420 ppm	a) 1.72 ppm b) 0.67 ppm c) 0.84 ppm d) 0.97 ppm	a) Santo Amaro b) Sao Braz c) Sao Francisco d) Controls, Guaibim Significantly higher levels in a)-c), $p<0.00005$, <0.0005, <0.05, respectively. Levels higher closer to smelter. 18-77 yr old fishermen from 3 riverside towns of the Subae River Basin in Brazil. Primary smelter (Santa Amaro) heavily pollutes river & air. Controls from Guaibim AAS

LEAD; CADMIUM; WATER POLLUTION; ENVIRONMENTAL EXPOSURE; OCCUPATIONAL EXPOSURE; HAIR; BRAZIL; AIR POLLUTION; SMELTERS

Carvalho, F.; Tavares, T.M.; Souza, S.P.; Linhares, P.C. 1984 Environmental Research 33:300-306

Tissue	Cases Exposure Route	Range	Mean	General Information
8955 Hair	a) 119 b) 24	a) 0.1-9.1 ppm b) 0.6-6.6 ppm	a) 1.0 ppm b) 1.9 ppm	a) Pottery workers b) Controls Pottery workers from Tlaquepaque and Tonala, Mexico, Controls from Tucson, AZ AAS

HAIR; OCCUPATIONAL EXPOSURE; ARIZONA; MEXICO; ADULTS; LEAD; CADMIUM; ARSENIC; VANADIUM; GOLD; ZINC; COPPER; IRON; MANGANESE; POTASSIUM

Weber, C.W.; Nelson, G.W.; deVaquera, M.V.; Pearson, P.B. 1984 Nutrition Reports International 30(5):1009-1018

Cadmium
7440-43-9
Cd
AtW 112.40, MP 321 C, BP 765 C, VP 1 mm Hg at 394 C, 10 mm Hg at 486 C

Tissue	Cases Exposure Route	Range	Mean	General Information
8956 Hair	a) 26 b) 26 c) 23 d) 23	a) 0.10-2.23 ppm b) 0.03-4.39 ppm c) 0.24->10.00 ppm d) 0.10-7.08 ppm	a) 0.59 b) 0.63 c) 1.45 d) 1.27 Geometric	a) Mothers, controls b) Newborn, controls c) Mothers, exposed d) Newborn exposed Ranges estimated from graph of cumulative frequency distribution. Differences between controls, exposed were significant - $p<0.01$, mothers, <0.05, newborn. Significant correlation between individual maternal/newborn levels allows quantification of systemic exposure by analysis of hair from either subject. Mothers occupationally exposed to heavy metals. Newborns. Matched controls. Rural area of eastern France. No adverse effects to newborns noted.

LEAD; CADMIUM; HAIR; NEWBORN; OCCUPATIONAL EXPOSURE; METALS; FRANCE; ADULTS; AGE
Huel, G.; Everson, R.B.; Menger, I. 1984 Environmental Research 35:115-121

Tissue	Cases Exposure Route	Range	Mean	General Information
8957 Hair		a) 2-2.4 ug/g b) 0.4-1 ug/g	a) Not given b) Not given	a) Nigeria, Kenya, some urban areas in Canada b) Most other countries New Zealand Levels from database containing data on "normal" levels of 15 elements in 7 tissues/fluids. Data selected by 60 investigators in over 40 countries. Diet, environment both important in distribution of elements.

ZINC; COPPER; MANGANESE; SELENIUM; LEAD; CADMIUM; BLOOD; BLOOD SERUM; HAIR; MILK; BANGLADESH; INDIA; TURKEY; FINLAND; ITALY; NEW ZEALAND; GUATEMALA; CHILE; SWEDEN; HUNGARY; YUGOSLAVIA; POLAND; KENYA; EGYPT; SOUTH AFRICA; UNITED STATES; AUSTRALIA; GREECE; PAKISTAN; NIGERIA; PHILIPPINES; ZAIRE; THAILAND; CHINA; WYOMING; OHIO; CALIFORNIA; JAPAN; MEXICO; CANADA; ISRAEL; PERU; SPAIN; COMPARATIVE EVALUATIONS; BIOLOGICAL MONITORING; IRAN; DIETS; ENVIRONMENTAL EXPOSURE
Iyengar, G.V. 1984 Science of the Total Environment 38:125-131

Tissue	Cases Exposure Route	Range	Mean	General Information
8958 Hair	54	a) Not given b) Not given	a) 7.92+/-1.77 ppm b) 1.54+/-0.43 ppm	a) Hypertensives b) Controls Statistically significant ($p</=0.05$) 20 adult black females classified as hypertensive, 14 adult black normotensive females Graphite furnace

HAIR; ENVIRONMENTAL EXPOSURE; MISSISSIPPI; ADULTS; HYPERTENSION; CARDIOVASCULAR DISEASES; LEAD POISONING; METAL POISONING; BIOPSIES; CADMIUM; COPPER; LEAD; ZINC; METALS; BIOACCUMULATION; BIOLOGICAL MONITORING
Medeiros, D.M.; Pellum, L.K. 1984 Bulletin of Environmental Contamination and Toxicology 32:528-532

Cadmium
7440-43-9
Cd
AtW 112.40, MP 321 C, BP 765 C, VP 1 mm Hg at 394 C, 10 mm Hg at 486 C

Tissue	Cases Exposure Route	Range	Mean	General Information
8060 Hair	a) 62 b) 70 c) 28 d) 28	a) 170-8300 ug/kg b) 160-1360 ug/kg c) 280-4100 ug/kg d) 190-2600 ug/kg	a) 480 ug/kg b) 490 ug/kg c) 610 ug/kg d) 520 ug/kg	a) Caucasian boys b) Caucasian girls c) Hindustani children d) Creol, Chinese, and Javanese subjects, migrated from Surinam 5 g scalp hair from occipital region. 8 yr old school children living in Amsterdam suburb NA; AAS

HAIR; ENVIRONMENTAL EXPOSURE; NETHERLANDS; CHILDREN; SEX; BIOACCUMULATION; BIOLOGICAL MONITORING; DIETS; COPPER; ZINC; LEAD; IRON; CADMIUM; SELENIUM; COBALT; SILVER; GOLD

Herber, R.P.M.; Wibowo, A.A.E.; Das, H.A.; Egger, R.J.; van Deyck, W.; Zielhuis, R.L. 1983 International Archives of Occupational and Environmental Health 53:127-137

Tissue	Cases Exposure Route	Range	Mean	General Information
8060 Hair				Review. Levels, body burdens, and health effects resulting from environmental, dietary, smoking and occupational exposures.

BLOOD; LUNGS; URINE; GASTROINTESTINAL TRACT; LIVER; KIDNEYS; HAIR; SWEAT; MILK; SALIVA; CONSUMER EXPOSURE; ENVIRONMENTAL EXPOSURE; OCCUPATIONAL EXPOSURE; BONE DISEASES; HYPERTENSION; KIDNEY DISEASES; NEOPLASMS; INDUSTRIAL DISEASES; METAL POISONING; RESPIRATORY DISEASES; REVIEW; CADMIUM; FUMES; HEALTH HAZARDS; INDUSTRIAL ATMOSPHERES; INHALATION; MINERAL METABOLISM; OCCUPATIONAL HAZARDS; SMOKING; TRANSPLACENTAL TRANSFER; WATER POLLUTION; FOOD CONTAMINATION

Hallenbeck, W.H. 1984 Experientia 40(2):136-142

Tissue	Cases Exposure Route	Range	Mean	General Information
8061 Heart	1 Inhalation	Not applicable	0.42 ppm	Autopsy Healthy 36 yr old man died about 5 days after smelting 182 kg lead for 24 hr in enclosed environment AAS

BLOOD; BRAIN; HEART; INTESTINES; KIDNEYS; LIVER; LUNGS; MUSCLES; SKIN; SPLEEN; STOMACH; URINE; ENVIRONMENTAL EXPOSURE; UNITED KINGDOM; ADULTS; AUTOPSIES; METAL POISONING; CADMIUM; LEAD; INHALATION

Taylor, A.; Jackson, M.A.; Patil, D.; Burston, J.; Lee, H.A. 1984 British Medical Journal 288:1270-1271

Tissue	Cases Exposure Route	Range	Mean	General Information
8062 Heart	894 Inhalation	a) Not given b) Not given	a) 0.466+/-0.332 ug/g b) 0.550+/-0.562 ug/g	a) Smokers (8 cigarettes or more/day) b) Nonsmokers and those smoking 7 cigarettes or less/day Autopsies. 0-94 yr olds from 8 regional hospitals, Japan AAS

JAPAN; AUTOPSIES; HEART; KIDNEYS; LIVER; METALS; ZINC; POPULATION EXPOSURE; SMOKING; TOBACCOS; DELIBERATE EXPOSURE; COPPER; CADMIUM

Iwao, S.; Tsuchiya, K.; Sugita, M. 1983 Archives of Environmental Health 38(3):156-162

Cadmium

7440-43-9
Cd
AtW 112.40, MP 321 C, BP 765 C, VP 1 mm Hg at 394 C, 10 mm Hg at 486 C

Tissue	Cases Exposure Route	Range	Mean	General Information
8963 Heart	86	<0.01-0.03 mg	Not given	Autopsies. Maximum in 60-69 yr olds. < 0.01 mg in >70 yr olds Range of geometric means Autopsies, accident victims, no chronic diseases. Residents of unpolluted areas, Finland. AAS

FINLAND; AUTOPSIES; HEART; KIDNEYS; LIVER; LUNGS; MUSCLES; PANCREAS; FORENSIC MEDICINE
Salmela, S.S.; Vuori, E.; Huunan-Seppala, A.; Kilpio, J.O.; Sumuvuori, H. 1983 Science of the Total Environment 27:89-95

Tissue	Cases Exposure Route	Range	Mean	General Information
8964 Intestine	1 Inhalation	Not applicable	0.00 ppm	Autopsy Healthy 36 yr old man died about 5 days after smelting 182 kg lead for 24 hr in enclosed environment AAS

BLOOD; BRAIN; HEART; INTESTINES; KIDNEYS; LIVER; LUNGS; MUSCLES; SKIN; SPLEEN; STOMACH; URINE; ENVIRONMENTAL EXPOSURE; UNITED KINGDOM; ADULTS; AUTOPSIES; METAL POISONING; CADMIUM; LEAD; INHALATION
Taylor, A.; Jackson, M.A.; Patil, D.; Burston, J.; Lee, H.A. 1984 British Medical Journal 288:1270-1271

Tissue	Cases Exposure Route	Range	Mean	General Information
8965 Kidney	5 Inhalation	9.07-80.80 ug/g Wet wt	17+/-8.76 ug/g S.E. Wet wt	Mean of 76% bound to low molecular wt protein Autopsies, 65-78 yr old males, heavy smokers, deaths from bronchial pneumonia, cardiac infarction, pulmonary edema, subarachnoidal bleeding, pulmonary cancer AAS

CADMIUM; AUTOPSIES; KIDNEYS; LIVER; LUNGS; DELIBERATE EXPOSURE; SWEDEN; CARDIOVASCULAR DISEASES; RESPIRATORY DISEASES; SMOKING
Post, G.; Johansson, B.; Allenmark, S. 1984 Environmental Research 34:29-37

Tissue	Cases Exposure Route	Range	Mean	General Information
8966 Kidney	82	Not given	199+/-87 ug/g Dry wt	Cortex. Positive correlation with age. Cd and Cd/Zn, Se positively correlated with postmortem evidence of hypertension only if age, gender not included in multiple regression equation. 16-60 yr old Caucasians autopsied in 1979-1981. Also measured: heart wt, body wt, height. Selected from group of 60. Cancer, kidney failure, extensive wt loss cases excluded. West Virginia AAS

SELENIUM; CADMIUM; ZINC; COPPER; AUTOPSIES; KIDNEYS; WEST VIRGINIA; HYPERTENSION; TRACE ELEMENTS
Horvath, D.J.; Barker, F.W.; Thayne, W.V.; Frost, J.L. 1984 Biological Trace Element Research 6:225-236

Cadmium

7440-43-9
Cd
AtW 112.40, MP 321 C, BP 765 C, VP 1 mm Hg at 394 C, 10 mm Hg at 486 C

Tissue	Cases Exposure Route	Range	Mean	General Information
8967 Kidney	2	a) Not applicable b) Not applicable	a) 67.05 ppm b) 0.58 ppm	Autopsies a) Healthy 36 yr old man died about 5 days after smelting 182 kg lead for 24 hr in enclosed environment b) Control, 60 yr old man without renal disease AAS

BLOOD; BRAIN; HEART; INTESTINES; KIDNEYS; LIVER; LUNGS; MUSCLES; SKIN; SPLEEN; STOMACH; URINE; ENVIRONMENTAL EXPOSURE; UNITED KINGDOM; ADULTS; AUTOPSIES; METAL POISONING; CADMIUM; LEAD; INHALATION

Taylor, A.; Jackson, M.A.; Patil, D.; Burston, J.; Lee, H.A. 1984 British Medical Journal 288:1270-1271

Tissue	Cases Exposure Route	Range	Mean	General Information
8968 Kidney				Review. Biological indicators of exposure and toxicity, advantages and disadvantages of monitoring each, discussed.

KIDNEYS; LIVER; REVIEW; ENVIRONMENTAL EXPOSURE; CADMIUM; BIOACCUMULATION; INDUSTRIAL POLLUTION

Shaikh, Z.A.; Smith, L.M. 1984 Experientia 40(1):36-43

Tissue	Cases Exposure Route	Range	Mean	General Information
8969 Kidney	a) 246 195	a) 5.0-36 ug/g b) 1.0-23 ug/g Wet wt	a) 26.92 ug/g b) 10.81 ug/g Wet wt	a) Subjects in Liege area, with Cd-pollution from past emission by non-ferrous metals industries b) Subjects in other regions of the country Autopsies at Liege and Belgium Hospitals. Ages 5-80. AAS

KIDNEYS; LIVER; ENVIRONMENTAL EXPOSURE; BELGIUM; JUVENILES; CHILDREN; ADULTS; AUTOPSIES; ADOLESCENTS; METAL POISONING; FORENSIC MEDICINE; CADMIUM; BIOACCUMULATION; INDUSTRIAL EMISSIONS; HEALTH HAZARDS; INDUSTRIAL POLLUTION; POPULATION EXPOSURE

Lauwerys, R.; Hardy, R.; Job, M.; Buchet, J.-P.; Roels, H.; Bruaux, P.; Rondia, D. 1984 Toxicology Letters 23:287-289

Cadmium

7440-43-9
Cd
AtW 112.40, MP 321 C, BP 765 C, VP 1 mm Hg at 394 C, 10 mm Hg at 486 C

Tissue	Cases Exposure Route	Range	Mean	General Information
8970 Kidney	a) 2 b) 9 c) 11 d) 12 e) 2 f) 6 g) 17 h) 18 Inhalation	a) Not given b) Not given c) Not given d) Not given e) Not given f) Not given g) Not given h) Not given	a) 16.7+/-1.1 mg b) 24.0+/-1.0 mg c) 23.0+/-1.7 mg d) 25.8+/-1.6 mg e) 10.6+/-5.2 mg f) 5.2+/-1.5 mg g) 6.7+/-1.5 mg h) 2.6+/-2.3 mg	a) Active workers, 1-5 yr exposure b) Active workers, 10-15 yr exposure c) Active workers, >20 yr exposure d) Retired workes, <5 yr after retirement e) Retired workers, >10 yr after retirement f) Non-exposed office workers g) Controls, smokers h) Controls, nonsmokers. Workers at cadmium production plant. Controls Prompt-gamma neutron-capture
LIVER; KIDNEYS; OCCUPATIONAL EXPOSURE; ADULTS; KIDNEY DISEASES; LIVER DISEASES; OCCUPATIONAL DISEASES; CADMIUM; BIOACCUMULATION; HEALTH HAZARDS; BIOLOGICAL MONITORING; INDUSTRIAL ATMOSPHERES; OCCUPATIONAL HAZARDS Ellis, K.J.; Yuen, K.; Yasumura, S.; Cohn, S.H. 1984 Environmental Research 33:216-226				

Tissue	Cases Exposure Route	Range	Mean	General Information
8971 Kidney				Review. Evaluation of concepts previously used in determining risk estimations and proposal of a new measure for that purpose.
LIVER; KIDNEYS; CONSUMER EXPOSURE; ENVIRONMENTAL EXPOSURE; OCCUPATIONAL EXPOSURE; KIDNEY DISEASES; METAL POISONING; MEASUREMENT METHODS; REVIEW; CADMIUM; FOOD CONTAMINATION; HEALTH HAZARDS; INDUSTRIAL ATMOSPHERES; INDUSTRIAL DISEASES; MINERAL METABOLISM; OCCUPATIONAL HAZARDS; POPULATION EXPOSURE Kjellstrom, T.; Elinder, C.-G.; Friberg, L. 1984 Environmental Research 33:284-295				

Tissue	Cases Exposure Route	Range	Mean	General Information
8972 Kidney	394 Inhalation	a) Not given b) Not given	a) 64.8+/-42.7 ug/g b) 45.5+/-32.6 ug/g	a) Smokers (5 cigarettes or more/day) b) Nonsmokers and those smoking 7 cigarettes or less/day Autopsies. 0-94 yr olds from 8 regional hospitals, Japan AAS
JAPAN; AUTOPSIES; HEART; KIDNEYS; LIVER; METALS; ZINC; POPULATION EXPOSURE; SMOKING; TOBACCOS; DELIBERATE EXPOSURE; COPPER; CADMIUM Iwao, S.; Tsuchiya, K.; Sugita, M. 1983 Archives of Environmental Health 38(3):156-162				

Cadmium
7440-43-9
Cd
AtW 112.40, MP 321 C, BP 765 C, VP 1 mm Hg at 394 C, 10 mm Hg at 486 C

Tissue	Cases Exposure Route	Range	Mean	General Information
8073 Kidney				Review. Levels, body burdens, and health effects resulting from environmental, dietary, smoking and occupational exposures.

BLOOD; LUNGS; URINE; GASTROINTESTINAL TRACT; LIVER; KIDNEYS; HAIR; SWEAT; MILK; SALIVA; CONSUMER EXPOSURE; ENVIRONMENTAL EXPOSURE; OCCUPATIONAL EXPOSURE; BONE DISEASES; HYPERTENSION; KIDNEY DISEASES; NEOPLASMS; INDUSTRIAL DISEASES; METAL POISONING; RESPIRATORY DISEASES; REVIEW; CADMIUM; FUMES; HEALTH HAZARDS; INDUSTRIAL ATMOSPHERES; INHALATION; MINERAL METABOLISM; OCCUPATIONAL HAZARDS; SMOKING; TRANSPLACENTAL TRANSFER; WATER POLLUTION; FOOD CONTAMINATION

Hallenbeck, W.H. 1984 Experientia 40(2):136-142

Tissue	Cases Exposure Route	Range	Mean	General Information
8074 Kidney	a) 188 b) 26 c) 51 d) 42 e) 30 f) 41 g) 50 h) 201 i) 20 j) 50	a) Not given b) Not given c) Not given d) Not given e) Not given f) Not given g) Not given h) Not given i) Not given j) Not given	a) 30.5+/-1.8 mg/kg b) 13.0+/-1.5 mg/kg c) 17.8+/-1.4 mg/kg d) 9.0+/-2.1 mg/kg e) 16.2+/-1.7 mg/kg f) 18.1+/-2.0 mg/kg g) 56.2+/-1.7 mg/kg h) 18.1+/-2.0 mg/kg i) 26.1+/-2.0 mg/kg j) 24.2+/-2.0 mg/kg Wet wt Geometric means	a) Belgium, Liege b) China, Beijing c) India, Ahmedabad d) India, Bangalore e) India, Calcutta f) Israel, Jerusalem g) Japan, Tokyo h) Sweden, Stockholm i) United States, Baltimore j) Yugoslavia, Zagreb Autopsies, cortex Levels varied with age, highest in 40-59 yr olds. Smokers, higher levels than nonsmokers. 10->60 yr olds, no kidney diseases, sudden deaths. AAS

BELGIUM; CHINA; INDIA; ISRAEL; JAPAN; MARYLAND; MEXICO; PERU; SWEDEN; UNITED STATES; YUGOSLAVIA; ADULTS; AGE; AUTOPSIES; CHILDREN; SEX; BLOOD; KIDNEYS; CADMIUM; COMPARATIVE EVALUATIONS; CADMIUM; LEAD ; METALS; BIOACCUMULATION; GASOLINE; POPULATION EXPOSURE; SMOKING; URBAN AREAS; ENVIRONMENTAL EXPOSURE

Friberg, L.; Vahter, M. 1983 Environmental Research 30:95-126

Tissue	Cases Exposure Route	Range	Mean	General Information
8075 Kidney	37 Inhalation	a) Not given b) Not given c) Not given	a) 12.4 mg b) 20.2 mg c) 28.7 mg	a) 0-10 yr b) 10-20 yr c) >20 yr Occupational exposures, years of employment. Smelter workers NAA

ADULTS; KIDNEY DISEASES; KIDNEYS; LIVER; URINE; COMPARATIVE EVALUATIONS; INDUSTRIAL ATMOSPHERES; OCCUPATIONAL EXPOSURE

Gomperts, D.; Fletcher, J.G.; Perkins, J.; Smith, N.J.; Chettle, D.R.; Mason, H.; Scott, M.C.; Topping, M.D.; Blindt, M. 1985 Lancet 1(8435):1186-1187

Cadmium
7440-43-9
Cd
AtW 112.40, MP 321 C, BP 765 C, VP 1 mm Hg at 394 C, 10 mm Hg at 486 C

Tissue	Cases Exposure Route	Range	Mean	General Information
8976 Kidney	86	0.17-5.03 mg	Not given	Autopsies. Maximum in 30-39 yr olds. 2.62 mg in >70 yr olds Range of geometric means Autopsies, accident victims, no chronic diseases. Residents of unpolluted areas, Finland. AAS
FINLAND; AUTOPSIES; HEART; KIDNEYS; LIVER; LUNGS; MUSCLES; PANCREAS; FORENSIC MEDICINE				
Salmela, S.S.; Vuori, E.; Huunan-Seppala, A.; Kilpio, J.O.; Sumuvuori, H. 1983 Science of the Total Environment 27:89-95				

Tissue	Cases Exposure Route	Range	Mean	General Information
8977 Kidney	266	a) Not given b) 0.088-1.15 ug/g c) 1.2-200 ug/g	a) 0.610 ug/g b) 0.863 ug/g c) 40.67 ug/g	a) Preserved specimens, 1897-1914 b) Preserved specimens, 1897-1937 c) Autopsy samples, 1980-1981 Renal cortex. Modern autopsy levels 47 times higher than historical samples. Ranges estimated from graph. Old anatomical specimens and new autopsy samples from adults AAS
KIDNEYS; LIVER; ENVIRONMENTAL EXPOSURE; AUTOPSIES; CADAVERS; CADMIUM; ADULTS; GERMANY; BIOCONCENTRATION				
Drasch, G.A. 1983 Science of the Total Environment 26:111-119				

Tissue	Cases Exposure Route	Range	Mean	General Information
8978 Kidney				Review. Metabolism and toxicity under conditions of excessive acute or chronic exposure.
LIVER; LUNGS; GASTROINTESTINAL TRACT; ERYTHROCYTES; KIDNEYS; PANCREAS; THYROID GLANDS; SALIVARY GLANDS; URINE; LYMPHOCYTES; BLOOD; CONSUMER EXPOSURE; ENVIRONMENTAL EXPOSURE; OCCUPATIONAL EXPOSURE; BONE DISEASES; HYPERTENSION; KIDNEY DISEASES; NEOPLASMS; INDUSTRIAL DISEASES; METAL POISONING; RESPIRATORY DISEASES; REVIEW; CADMIUM; FUMES; HEALTH HAZARDS; INDUSTRIAL ATMOSPHERES; INHALATION; MINERAL METABOLISM; OCCUPATIONAL HAZARDS; SMOKING; WATER POLLUTION; FOOD CONTAMINATION				
Bernard, A.; Lauwerys, R. 1984 Experientia 40(2):143-152				

Tissue	Cases Exposure Route	Range	Mean	General Information
8979 Liver	5 Inhalation	1.52-2.76 ug/g Wet wt	2.21+/-0.63 ug/g S.E. Wet wt	Mean of 76% bound to low molecular wt protein Autopsies, 65-78 yr old males, heavy smokers, deaths from bronchial pneumonia, cardiac infarction, pulmonary edema, subarachnoidal bleeding, pulmonary cancer AAS
CADMIUM; AUTOPSIES; KIDNEYS; LIVER; LUNGS; DELIBERATE EXPOSURE; SWEDEN; CARDIOVASCULAR DISEASES; RESPIRATORY DISEASES; SMOKING				
Post, C.; Johansson, B.; Allenmark, S. 1984 Environmental Research 34:29-37				

Cadmium
7440-43-9
Cd
AtW 112.40, MP 321 C, BP 765 C, VP 1 mm Hg at 394 C, 10 mm Hg at 486 C

Tissue	Cases Exposure Route	Range	Mean	General Information
8960 Liver	2	a) Not applicable b) Not applicable	a) 1.37 ppm b) 0.63 ppm	Autopsies a) Healthy 36 yr old man died about 5 days after smelting 182 kg lead for 24 hr in enclosed environment b) Control, 40 yr old man without renal disease AAS
BLOOD; BRAIN; HEART; INTESTINES; KIDNEYS; LIVER; LUNGS; MUSCLES; SKIN; SPLEEN; STOMACH; URINE; ENVIRONMENTAL EXPOSURE; UNITED KINGDOM; ADULTS; AUTOPSIES; METAL POISONING; CADMIUM; LEAD; INHALATION Taylor, A.; Jackson, M.A.; Patil, D.; Burston, J.; Lee, H.A. 1984 British Medical Journal 288:1270-1271				

Tissue	Cases Exposure Route	Range	Mean	General Information
8981 Liver				Review. Biological indicators of exposure and toxicity, advantages and disadvantages of monitoring each, discussed.
KIDNEYS; LIVER; REVIEW; ENVIRONMENTAL EXPOSURE; CADMIUM; BIOACCUMULATION; INDUSTRIAL POLLUTION Shaikh, Z.A.; Smith, L.M. 1984 Experientia 40(1):36-43				

Tissue	Cases Exposure Route	Range	Mean	General Information
8982 Liver	a) 70 b) 181	a) 6-30 ug/g b) 3-17 ug/g Wet wt	a) 10.40 ug/g b) 12.86 ug/g Wet wt	a) Subjects in Liege area, with Cd-pollution from past emission by non-ferrous metals industries b) Subjects in other regions of the country Autopsies at Liege and Belgium Hospitals. Ages 5-80. AAS
KIDNEYS; LIVER; ENVIRONMENTAL EXPOSURE; BELGIUM; JUVENILES- CHILDREN; ADULTS; AUTOPSIES; ADOLESCENTS; METAL POISONING; FORENSIC MEDICINE; CADMIUM; BIOACCUMULATION; INDUSTRIAL EMISSIONS; HEALTH HAZARDS; INDUSTRIAL POLLUTION; POPULATION EXPOSURE Lauwerys, R.; Hardy, R.; Job, M.; Buchet, J.-P.; Roels, H.; Bruaux, P.; Rondia, D. 1984 Toxicology Letters 23:287-289				

Tissue	Cases Exposure Route	Range	Mean	General Information
8983 Liver	554 Inhalation	a) Not given b) Not given	a) 5.24+/-3.19 ug/g b) 2.86+/-2.41 ug/g	a) Smokers (8 or more cigarettes/day) b) Nonsmokers and those smoking 7 cigarettes or less/day Significantly different, $p < 0.05$. 0-94 yr olds from 8 regional hospitals, Japan AAS
JAPAN; AUTOPSIES; HEART; KIDNEYS; LIVER; METALS; ZINC; POPULATION EXPOSURE; SMOKING; TOBACCOS; DELIBERATE EXPOSURE; COPPER; CADMIUM Iwao, S.; Tsuchiya, K.; Sugita, M. 1983 Archives of Environmental Health 38(3):156-162				

Cadmium

7440-43-9
Cd
AtW 112.40, MP 321 C, BP 765 C, VP 1 mm Hg at 394 C, 10 mm Hg at 486 C

Tissue	Cases Exposure Route	Range	Mean	General Information
8984 Liver		a) 0.25-4.84 ug/g b) -/<0.2-5.2 ug/g c) 0.16-3.31 ug/g	a) 1.62 ug/g b) -/<1.57 ug/g c) 1.19 ug/g	a) 1 sample per liver (36), AAS b) 2 samples from 34 livers, 1 from each of 2, NA c) 1 sample from 24 of 36 livers, voltammetry Normal tissues from autopsies. Baltimore, MD; Minneapolis, MN, Seattle, WA AAS; NA; Voltammetry
LIVER; ENVIRONMENTAL EXPOSURE; AUTOPSIES; COMPARATIVE EVALUATIONS; MEASUREMENT METHODS; ALUMINUM; CADMIUM; COPPER; LEAD; MANGANESE; SELENIUM; ZINC Zeisler, R.; Harrison, S.H.; Wise, S.A. 1984 Biological Trace Element Research 6:31-49				

Tissue	Cases Exposure Route	Range	Mean	General Information
8985 Liver				Review. Levels, body burdens, and health effects resulting from environmental, dietary, smoking and occupational exposures.
BLOOD; LUNGS; URINE; GASTROINTESTINAL TRACT; LIVER; KIDNEYS; HAIR; SWEAT; MILK; SALIVA; CONSUMER EXPOSURE; ENVIRONMENTAL EXPOSURE; OCCUPATIONAL EXPOSURE; BONE DISEASES; HYPERTENSION; KIDNEY DISEASES; NEOPLASMS; INDUSTRIAL DISEASES; METAL POISONING; RESPIRATORY DISEASES; REVIEW; CADMIUM; FUMES; HEALTH HAZARDS; INDUSTRIAL ATMOSPHERES; INHALATION; MINERAL METABOLISM; OCCUPATIONAL HAZARDS; SMOKING; TRANSPLACENTAL TRANSFER; WATER POLLUTION; FOOD CONTAMINATION Hallenbeck, W.H. 1984 Experientia 40(2):136-142				

Tissue	Cases Exposure Route	Range	Mean	General Information
8986 Liver	96	a) 0.2-6.2 mg/kg b) 0.8-4.60 mg/kg	a) 1.73 +or- 1.54 mg/kg b) 1.30 +or- 0.86 mg/kg	a) Females b) Males Autopsies. Positive correlation with age. Levels generally lower than those in other countries. No major regional variations. New Zealanders. Death by physical injuries AAS
LIVER; COMPARATIVE EVALUATIONS; ARSENIC; CADMIUM; CHROMIUM; COBALT; COPPER; NEW ZEALAND; AUTOPSIES; LEAD; MANGANESE; MERCURY; NICKEL; SELENIUM; SILVER; ZINC Pickston, L.; Lewin, J.F.; Drysdale, J.M.; Smith, J.M.; Bruce, J. 1983 Journal of Analytical Toxicology 7:2-6				

Cadmium

7440-43-0
Cd
AtW 112.40, MP 321 C, BP 765 C, VP 1 mm Hg at 394 C, 10 mm Hg at 488 C

Tissue	Cases Exposure Route	Range	Mean	General Information
8587 Liver	87 Inhalation	a) Not given b) Not given c) Not given	a) 24.4 ppm b) 45.0 ppm c) 66.6 ppm	a) 0-10 yr b) 10-20 yr c) > 20 yr Occupational exposures, years of employment. Smelter workers NA
ADULTS; KIDNEY DISEASES; KIDNEYS; LIVER; URINE; COMPARATIVE EVALUATIONS; INDUSTRIAL ATMOSPHERES; OCCUPATIONAL EXPOSURE Gomperts, D.; Fletcher, J.G.; Perkins, J.; Smith, N.J.; Chettle, D.R.; Mason, H.; Scott, M.C.; Topping, M.D.; Bliadt, M. 1988 Lancet 1(8595):1185-1187				

Tissue	Cases Exposure Route	Range	Mean	General Information
8966 Liver	66	0.01-1.96 mg	Not given	Autopsies. Maximum in 60-69 yr olds. 1.47 mg in >70 yr olds Range of geometric means Autopsies, accident victims, no chronic diseases. Residents of unpolluted areas, Finland. AAS
FINLAND; AUTOPSIES; HEART; KIDNEYS; LIVER; LUNGS; MUSCLES; PANCREAS; FORENSIC MEDICINE Salmela, S.S.; Vuori, E.; Huunan-Seppala, A.; Kilpio, J.O.; Sumuvuori, H. 1988 Science of the Total Environment 27:89-95				

Tissue	Cases Exposure Route	Range	Mean	General Information
8969 Liver	265	a) Not given b) Not given	a) 15 ppm b) 8 ppm	a) Exposed b) Unexposed No correlation with smoking history or length of residence in mining or smelting area Exposed smelters, electroplaters, welders. Unexposed factory and mine workers. Australia No clinical evidence of toxicity NA
AUSTRALIA ; LIVER; BLOOD; URINE; IN VIVO ANALYSIS; CADMIUM; INDUSTRIAL AREAS; INDUSTRIAL POLLUTION; HEALTH HAZARDS; INDUSTRIAL PLANTS; SMELTERS; OCCUPATIONAL EXPOSURE Baddeley Thomas, B.J.; Thomas, B.W.; Summers, V. 1988 British Journal of Radiology 56:449-451				

Cadmium
7440-43-9
Cd
AtW 112.40, MP 321 C, BP 765 C, VP 1 mm Hg at 394 C, 10 mm Hg at 486 C

Tissue	Cases Exposure Route	Range	Mean	General Information
8990 Liver	a) 2 b) 9 c) 11 d) 12 e) 2 f) 8 g) 17 h) 13 Inhalation	a) Not given b) Not given c) Not given d) Not given e) Not given f) Not given g) Not given h) Not given	a) 10.7+/-1.2 ppm b) 38.5+/-2.0 ppm c) 35.1+/-2.2 ppm d) 45.8+/-3.1 ppm e) 13.5+/-1.5 ppm f) 7.5+/-1.7 ppm g) 5.8+/-1.7 ppm h) 1.9+/-2.5 ppm	a) Active workers, 1-5 yr exposure b) Active workers, 10-15 yr exposure c) Active workers, >20 yr exposure d) Retired workes, <5 yr after retirement e) Retired workers, >10 yr after retirement f) Non-exposed office workers g) Controls, smokers h) Controls, nonsmokers. Workers at cadmium production plant. Controls Prompt-gamma neutron-capture
LIVER; KIDNEYS; OCCUPATIONAL EXPOSURE; ADULTS; KIDNEY DISEASES; LIVER DISEASES; OCCUPATIONAL DISEASES; CADMIUM; BIOACCUMULATION; HEALTH HAZARDS; BIOLOGICAL MONITORING; INDUSTRIAL ATMOSPHERES; OCCUPATIONAL HAZARDS Ellis, K.J.; Yuen, K.; Yasumura, S.; Cohn, S.H. 1984 Environmental Research 33:216-226				

Tissue	Cases Exposure Route	Range	Mean	General Information
8991 Liver				Review. Metabolism and toxicity under conditions of excessive acute or chronic exposure.
LIVER; LUNGS; GASTROINTESTINAL TRACT; ERYTHROCYTES; KIDNEYS; PANCREAS; THYROID GLANDS; SALIVARY GLANDS; URINE; LYMPHOCYTES; BLOOD; CONSUMER EXPOSURE; ENVIRONMENTAL EXPOSURE; OCCUPATIONAL EXPOSURE; BONE DISEASES; HYPERTENSION; KIDNEY DISEASES; NEOPLASMS; INDUSTRIAL DISEASES; METAL POISONING; RESPIRATORY DISEASES; REVIEW; CADMIUM; FUMES; HEALTH HAZARDS; INDUSTRIAL ATMOSPHERES; INHALATION; MINERAL METABOLISM; OCCUPATIONAL HAZARDS; SMOKING; WATER POLLUTION; FOOD CONTAMINATION Bernard, A.; Lauwerys, R. 1984 Experientia 40(2):148-152				

Tissue	Cases Exposure Route	Range	Mean	General Information
8992 Liver	260	a) Not given b) Not given c) Not given d) Not given e) Not given f) Not given g) Not given	a) 1.368 ug/g b) 1.126 ug/g c) 1.15 ug/g d) 1.21 ug/g e) 1.01 ug/g f) 0.84 ug/g g) 1.58 ug/g	a) 1897-1914, preserved specimens b) 1897-1927, preserved specimens c) 1960-1981, autopsy samples d) 1960-1981, not diseased e) 1960-1981, fatty degeneration f) 1960-1981, liver cirrhosis g) 1960-1981, other liver diseases. Old anatomical specimens and new autopsy samples from adults AAS
KIDNEYS; LIVER; ENVIRONMENTAL EXPOSURE; AUTOPSIES; CADAVERS; CADMIUM; ADULTS; GERMANY; BIOCONCENTRATION Drasch, G.A. 1983 Science of the Total Environment 26:111-119				

Cadmium

7440-43-9
Cd
AtW 112.40, MP 321 C, BP 765 C, VP 1 mm Hg at 394 C, 10 mm Hg at 486 C

Tissue	Cases Exposure Route	Range	Mean	General Information
8993 Liver				Review. Evaluation of concepts previously used in determining critical concentrations in kidney, and proposal of a new measure for that purpose.

LIVER; KIDNEYS; CONSUMER EXPOSURE; ENVIRONMENTAL EXPOSURE; OCCUPATIONAL EXPOSURE; KIDNEY DISEASES; METAL POISONING; MEASUREMENT METHODS; REVIEW; CADMIUM; FOOD CONTAMINATION; HEALTH HAZARDS; INDUSTRIAL ATMOSPHERES; INDUSTRIAL DISEASES; MINERAL METABOLISM; OCCUPATIONAL HAZARDS; POPULATION EXPOSURE

Kjellstrom, T.; Elinder, C.-G.; Friberg, L. 1984 Environmental Research 33:284-295

Tissue	Cases Exposure Route	Range	Mean	General Information
8994 Lung	5 Inhalation	0.20-1.09 ug/g Wet wt	0.50+/-0.35 ug/g S.E. Wet wt	Mean of 56% bound to low molecular wt protein Autopsies, 65-78 yr old males, heavy smokers, deaths from bronchial pneumonia, cardiac infarction, pulmonary edema, subarachnoidal bleeding, pulmonary cancer AAS

CADMIUM; AUTOPSIES; KIDNEYS; LIVER; LUNGS; DELIBERATE EXPOSURE; SWEDEN; CARDIOVASCULAR DISEASES; RESPIRATORY DISEASES; SMOKING

Post, C.; Johansson, B.; Allenmark, S. 1984 Environmental Research 34:29-37

Tissue	Cases Exposure Route	Range	Mean	General Information
8995 Lung	2	a) Not applicable b) Not applicable	a) 0.82 ppm b) 0.066 ppm	Autopsies a) Healthy 36 yr old man died about 5 days after smelting 182 kg lead for 24 hr in enclosed environment b) Control, 60 yr old man without renal disease AAS

BLOOD; BRAIN; HEART; INTESTINES; KIDNEYS; LIVER; LUNGS; MUSCLES; SKIN; SPLEEN; STOMACH; URINE; ENVIRONMENTAL EXPOSURE; UNITED KINGDOM; ADULTS; AUTOPSIES; METAL POISONING; CADMIUM; LEAD; INHALATION

Taylor, A.; Jackson, M.A.; Patil, D.; Burston, J.; Lee, H.A. 1984 British Medical Journal 288:1270-1271

Tissue	Cases Exposure Route	Range	Mean	General Information
8996 Lung				Review. Levels, body burdens, and health effects resulting from environmental, dietary, smoking and occupational exposures.

BLOOD; LUNGS; URINE; GASTROINTESTINAL TRACT; LIVER; KIDNEYS; HAIR; SWEAT; MILK; SALIVA; CONSUMER EXPOSURE; ENVIRONMENTAL EXPOSURE; OCCUPATIONAL EXPOSURE; BONE DISEASES; HYPERTENSION; KIDNEY DISEASES; NEOPLASMS; INDUSTRIAL DISEASES; METAL POISONING; RESPIRATORY DISEASES; REVIEW; CADMIUM; FUMES; HEALTH HAZARDS; INDUSTRIAL ATMOSPHERES; INHALATION; MINERAL METABOLISM; OCCUPATIONAL HAZARDS; SMOKING; TRANSPLACENTAL TRANSFER; WATER POLLUTION; FOOD CONTAMINATION

Hallenbeck, W.H. 1984 Experientia 40(2):136-142

Cadmium

7440-43-9
Cd
AtW 112.40, MP 321 C, BP 765 C, VP 1 mm Hg at 394 C, 10 mm Hg at 486 C

Tissue	Cases Exposure Route	Range	Mean	General Information
8997 Lung	86	<0.01-0.35 mg	Not given	Autopsies. Maximum, in 30-39 yr olds. <0.01 mg in >70 yr olds Range of geometric means
				Autopsies, accident victims, no chronic diseases. Residents of unpolluted areas, Finland. AAS
FINLAND; AUTOPSIES; HEART; KIDNEYS; LIVER; LUNGS; MUSCLES; PANCREAS; FORENSIC MEDICINE				
Salmela, S.S.; Vuori, E.; Huunan-Seppala, A.; Kilpio, J.O.; Sumuvuori, H. 1983 Science of the Total Environment 27:89-95				

Tissue	Cases Exposure Route	Range	Mean	General Information
8088 Lung				Review. Metabolism and toxicity under conditions of excessive acute or chronic exposure.
LIVER; LUNGS; GASTROINTESTINAL TRACT; ERYTHROCYTES; KIDNEYS; PANCREAS; THYROID GLANDS; SALIVARY GLANDS; URINE; LYMPHOCYTES; BLOOD; CONSUMER EXPOSURE; ENVIRONMENTAL EXPOSURE; OCCUPATIONAL EXPOSURE; BONE DISEASES; HYPERTENSION; KIDNEY DISEASES; NEOPLASMS; INDUSTRIAL DISEASES; METAL POISONING; RESPIRATORY DISEASES; REVIEW; CADMIUM; FUMES; HEALTH HAZARDS; INDUSTRIAL ATMOSPHERES; INHALATION; MINERAL METABOLISM; OCCUPATIONAL HAZARDS; SMOKING; WATER POLLUTION; FOOD CONTAMINATION				
Bernard, A.; Lauwerys, R. 1984 Experientia 40(2):143-152				

Tissue	Cases Exposure Route	Range	Mean	General Information
8000 Milk	7	a) 1.7-8.1 ug/l b) 1.3-2.5 ug/l c) 1.3-2.0 ug/l	a) 2.0 ug/l b) 1.5 ug/l c) 1.6 ug/l Medians	a) Month 1, lactation b) Month 3, lactation c) Month 6, lactation Equal proportions of foremilk and hindmilk collected over 24 hr. 1 sample/mother. Mean weekly intake of totally breast-fed infants was calculated as 2.7 and 1.5 ug/kg, 1st and 3rd mo. These values were below the WHO tolerable weekly intake (6.7-8.3 ug/kg). Healthy non-smoking, primiparae, Helsinki, Finland AAS
MILK; ENVIRONMENTAL EXPOSURE; FINLAND; ADULTS; COMPARATIVE EVALUATIONS; CADMIUM; METALS; TRACE ELEMENTS; LACTATION				
Vuori, E.; Vetter, M.; Kuitunen, P; Salmela, S. 1983 Archives of Toxicology 53:207-211				

Tissue	Cases Exposure Route	Range	Mean	General Information
9000 Milk				Review. Levels after occupational exposures to trace metals, solvents, and halogenated hydrocarbons, discussed in terms of milk partition factors, potential infant exposures, possible health effects.
MILK; ENVIRONMENTAL EXPOSURE; ADULTS; REVIEW; MERCURY; LEAD; DDT; DIELDRIN; POLYCHLORINATED BIPHENYLS; POLYBROMINATED BIPHENYLS; CHROMIUM; CADMIUM; HEPTACHLOR EPOXIDE; OXYCHLORDANE; BIOACCUMULATION; LACTATION; HEALTH HAZARDS				
Wolff, M.S. 1983 American Journal of Industrial Medicine 4:259-281				

Cadmium
7440-43-9
Cd
AtW 112.40, MP 321 C, BP 765 C, VP 1 mm Hg at 394 C, 10 mm Hg at 486 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9001 Milk		a) Not given b) Not given	a) 8 ng/ml b) 1.7 ng/ml	a) Nigeria, Phillipines b) Levels up to this value in Zaire, Hungary, Sweden, Guatemala, New Zealand Levels from database containing data on "normal" levels of 15 elements in 7 tissues/fluids. Data selected by 60 investigators in over 40 countries. Diet, environment both important in distribution of elements.

ZINC; COPPER; MANGANESE; SELENIUM; LEAD; CADMIUM; BLOOD; BLOOD SERUM; HAIR; MILK; BANGLADESH; INDIA; TURKEY; FINLAND; ITALY; NEW ZEALAND; GUATEMALA; CHILE; SWEDEN; HUNGARY; YUGOSLAVIA; POLAND; KENYA; EGYPT; SOUTH AFRICA; UNITED STATES; AUSTRALIA; GREECE; PAKISTAN; NIGERIA; PHILIPPINES; ZAIRE; THAILAND; CHINA; WYOMING; OHIO; CALIFORNIA; JAPAN; MEXICO; CANADA; ISRAEL; PERU; SPAIN; COMPARATIVE EVALUATIONS; BIOLOGICAL MONITORING; IRAN; DIETS; ENVIRONMENTAL EXPOSURE

Iyengar, G.V. 1984 Science of the Total Environment 36:125-131

Tissue	Cases Exposure Route	Range	Mean	General Information
9002 Milk				Review. Chemicals found in occupational exposures are discussed in terms of milk partition factors, potential infant exposures and possible infant health effects.

LEAD; MERCURY; PESTICIDES; POLYCHLORINATED BIPHENYLS; OCCUPATIONAL HAZARDS; MILK; COMPARATIVE EVALUATIONS; REVIEW; CADMIUM; CHROMIUM; DDT; DIELDRIN; INFANTS

Wolff, M.S. 1983 American Journal of Industrial Medicine 4:259-281

Tissue	Cases Exposure Route	Range	Mean	General Information
9003 Milk				Review. Levels, body burdens, and health effects resulting from environmental, dietary, smoking and occupational exposures.

BLOOD; LUNGS; URINE; GASTROINTESTINAL TRACT; LIVER; KIDNEYS; HAIR; SWEAT; MILK; SALIVA; CONSUMER EXPOSURE; ENVIRONMENTAL EXPOSURE; OCCUPATIONAL EXPOSURE; BONE DISEASES; HYPERTENSION; KIDNEY DISEASES; NEOPLASMS; INDUSTRIAL DISEASES; METAL POISONING; RESPIRATORY DISEASES; REVIEW; CADMIUM; FUMES; HEALTH HAZARDS; INDUSTRIAL ATMOSPHERES; INHALATION; MINERAL METABOLISM; OCCUPATIONAL HAZARDS; SMOKING; TRANSPLACENTAL TRANSFER; WATER POLLUTION; FOOD CONTAMINATION

Hallenbeck, W.H. 1984 Experientia 40(2):136-142

Cadmium
7440-43-9
Cd
AtW 112.40, MP 321 C, BP 765 C, VP 1 mm Hg at 394 C, 10 mm Hg at 486 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9004 Milk	a) 10 b) 18 c) 2	a) <3-<5 ug/kg b) <3-5.4 ug/kg c) <3-<2 ug/kg Dry wt	a) Not given b) Not given c) Not given	a) Colostrum (1st or 2nd day post partum) b) Transitional milk (3-8 days post partum) c) Mature milk (1-8 mo post partum) Slovenia, Yugoslavia NA

MILK; ARSENIC; CADMIUM; COBALT; COPPER; MERCURY; IODINE; MANGANESE; ANTIMONY; SELENIUM; VANADIUM; ZINC; YUGOSLAVIA; ENVIRONMENTAL EXPOSURE
Kosta, L.; Byrne, A.R. Dermelj, M. 1983 Science of the Total Environment 30:261-268

Tissue	Cases Exposure Route	Range	Mean	General Information
9005 Muscle	2	a) Not applicable b) Not applicable	a) 0.21 ppm b) 0.058 ppm	Autopsies a) Healthy 36 yr old man died about 5 days after smelting 182 kg lead for 24 hr in enclosed environment b) Control, 60 yr old man without renal disease AAS

BLOOD; BRAIN; HEART; INTESTINES; KIDNEYS; LIVER; LUNGS; MUSCLES; SKIN; SPLEEN; STOMACH; URINE; ENVIRONMENTAL EXPOSURE; UNITED KINGDOM; ADULTS; AUTOPSIES; METAL POISONING; CADMIUM; LEAD; INHALATION
Taylor, A.; Jackson, M.A.; Patil, D.; Burston, J.; Lee, H.A. 1984 British Medical Journal 288:1270-1271

Tissue	Cases Exposure Route	Range	Mean	General Information
9006 Muscle	86	<0.01-1.89 mg	Not given	Autopsies. Maximum in 60-69 yr olds. 0.03 mg in >70 yr olds Range of geometric means Autopsies, accident victims, no chronic diseases. Residents of unpolluted areas, Finland. AAS
9007 Pancreas	86	<0.01-0.06 mg	Not given	Autopsies. Maximum in 40-49 yr olds. 0.03 mg in >70 yr olds Range of geometric means Autopsies, accident victims, no chronic diseases. Residents of unpolluted areas, Finland. AAS

FINLAND; AUTOPSIES; HEART; KIDNEYS; LIVER; LUNGS; MUSCLES; PANCREAS; FORENSIC MEDICINE
Salmela, S.S.; Vuori, E.; Huunan-Seppala, A.; Kilpio, J.O.; Sumuvuori, H. 1983 Science of the Total Environment 27:89-95

Cadmium
7440-43-9
Cd
AtW 112.40, MP 321 C, BP 765 C, VP 1 mm Hg at 394 C, 10 mm Hg at 486 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9008 Pancreas				Review. Metabolism and toxicity under conditions of excessive acute or chronic exposure.
LIVER; LUNGS; GASTROINTESTINAL TRACT; ERYTHROCYTES; KIDNEYS; PANCREAS; THYROID GLANDS; SALIVARY GLANDS; URINE; LYMPHOCYTES; BLOOD; CONSUMER EXPOSURE; ENVIRONMENTAL EXPOSURE; OCCUPATIONAL EXPOSURE; BONE DISEASES; HYPERTENSION; KIDNEY DISEASES; NEOPLASMS; INDUSTRIAL DISEASES; METAL POISONING; RESPIRATORY DISEASES; REVIEW; CADMIUM; FUMES; HEALTH HAZARDS; INDUSTRIAL ATMOSPHERES; INHALATION; MINERAL METABOLISM; OCCUPATIONAL HAZARDS; SMOKING; WATER POLLUTION; FOOD CONTAMINATION Bernard, A.; Lauwerys, R. 1984 Experientia 40(2):143-152				

Tissue	Cases Exposure Route	Range	Mean	General Information
9009 Placenta	251	1-81 ppb	30+/-8 ppb	113 cases Nagoya, Japan, 1974-1978, Normal deliveries. AAS
ZINC; MERCURY; METHYLMERCURY; LEAD; CADMIUM; MANGANESE; COPPER; IRON; JAPAN; BLOOD; PLACENTA; UMBILICAL CORD; METALS; ENVIRONMENTAL EXPOSURE Tsuchiya, H.; Mitani, K.; Kodama, K.; Nakata, T. 1984 Archives of Environmental Health 39(1):11-17				

Tissue	Cases Exposure Route	Range	Mean	General Information
9010 Placenta				Review. Discussion of relationship to specificity of fetal effects, follow-up, possible mechanisms of toxicity. Specimens from U.S., W. Germany, Belgium
PLACENTA; ALABAMA; BELGIUM; CALIFORNIA; GEORGIA; GERMANY; IOWA; JAPAN; MISSOURI; NEW JERSEY; NEW YORK; NORTH CAROLINA; OHIO; TENNESSEE; TEXAS; UNITED KINGDOM; UTAH; CADMIUM; COPPER; LEAD; MERCURY; MERCURY INORGANIC COMPOUNDS; MERCURY ORGANIC COMPOUNDS; ZINC; PREGNANCY; BEHAVIOR DISORDERS Miller, R.K. 1984 American Journal of Industrial Medicine 4:205-244				

Tissue	Cases Exposure Route	Range	Mean	General Information
9011 Saliva				Review. Levels, body burdens, and health effects resulting from environmental, dietary, smoking and occupational exposures.
BLOOD; LUNGS; URINE; GASTROINTESTINAL TRACT; LIVER; KIDNEYS; HAIR; SWEAT; MILK; SALIVA; CONSUMER EXPOSURE; ENVIRONMENTAL EXPOSURE; OCCUPATIONAL EXPOSURE; BONE DISEASES; HYPERTENSION; KIDNEY DISEASES; NEOPLASMS; INDUSTRIAL DISEASES; METAL POISONING; RESPIRATORY DISEASES; REVIEW; CADMIUM; FUMES; HEALTH HAZARDS; INDUSTRIAL ATMOSPHERES; INHALATION; MINERAL METABOLISM; OCCUPATIONAL HAZARDS; SMOKING; TRANSPLACENTAL TRANSFER; WATER POLLUTION; FOOD CONTAMINATION Hallenbeck, W.H. 1984 Experientia 40(2):136-142				

Cadmium
7440-43-9
Cd
AtW 112.40, MP 321 C, BP 765 C, VP 1 mm Hg at 394 C, 10 mm Hg at 486 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9012 Salivary gland				Review. Metabolism and toxicity under conditions of excessive acute or chronic exposure.

LIVER; LUNGS; GASTROINTESTINAL TRACT; ERYTHROCYTES; KIDNEYS; PANCREAS; THYROID GLANDS; SALIVARY GLANDS; URINE; LYMPHOCYTES; BLOOD; CONSUMER EXPOSURE; ENVIRONMENTAL EXPOSURE; OCCUPATIONAL EXPOSURE; BONE DISEASES; HYPERTENSION; KIDNEY DISEASES; NEOPLASMS; INDUSTRIAL DISEASES; METAL POISONING; RESPIRATORY DISEASES; REVIEW; CADMIUM; FUMES; HEALTH HAZARDS; INDUSTRIAL ATMOSPHERES; INHALATION; MINERAL METABOLISM; OCCUPATIONAL HAZARDS; SMOKING; WATER POLLUTION; FOOD CONTAMINATION

Bernard, A.; Lauwerys, R. 1984. Experientia 40(2):143-152

Tissue	Cases Exposure Route	Range	Mean	General Information
9013 Skin	2	a) Not applicable b) Not applicable	a) 0.24 ppm b) 0.034 ppm	Autopsies a) Healthy 66 yr old man died about 5 days after smelting 182 kg lead for 24 hr in enclosed environment b) Control, 60 yr old man without renal disease AAS
9014 Stomach	Inhalation	Not applicable	0.43 ppm	Autopsy Healthy 36 yr old man died about 5 days after smelting 182 kg lead for 24 hr in enclosed environment AAS

BLOOD; BRAIN; HEART; INTESTINES; KIDNEYS; LIVER; LUNGS; MUSCLES; SKIN; SPLEEN; STOMACH; URINE; ENVIRONMENTAL EXPOSURE; UNITED KINGDOM; ADULTS; AUTOPSIES; METAL POISONING; CADMIUM; LEAD; INHALATION

Taylor, A.; Jackson, M.A.; Patil, D.; Burston, J.; Lee, H.A. 1984. British Medical Journal 288:1270-1271

Tissue	Cases Exposure Route	Range	Mean	General Information
9015 Sweat				Review. Levels, body burdens, and health effects resulting from environmental, dietary, smoking and occupational exposures.

BLOOD; LUNGS; URINE; GASTROINTESTINAL TRACT; LIVER; KIDNEYS; HAIR; SWEAT; MILK; SALIVA; CONSUMER EXPOSURE; ENVIRONMENTAL EXPOSURE; OCCUPATIONAL EXPOSURE; BONE DISEASES; HYPERTENSION; KIDNEY DISEASES; NEOPLASMS; INDUSTRIAL DISEASES; METAL POISONING; RESPIRATORY DISEASES; REVIEW; CADMIUM; FUMES; HEALTH HAZARDS; INDUSTRIAL ATMOSPHERES; INHALATION; MINERAL METABOLISM; OCCUPATIONAL HAZARDS; SMOKING; TRANSPLACENTAL TRANSFER; WATER POLLUTION; FOOD CONTAMINATION

Hollenbeck, W.H. 1984. Experientia 40(2):139-142

Cadmium
7440-43-9
Cd
AtW 112.40, MP 321 C, BP 765 C, VP 1 mm Hg at 394 C, 10 mm Hg at 486 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9016 Thyroid gland				Review. Metabolism and toxicity under conditions of excessive acute or chronic exposure.
LIVER; LUNGS; GASTROINTESTINAL TRACT; ERYTHROCYTES; KIDNEYS; PANCREAS; THYROID GLANDS; SALIVARY GLANDS; URINE; LYMPHOCYTES; BLOOD; CONSUMER EXPOSURE; ENVIRONMENTAL EXPOSURE; OCCUPATIONAL EXPOSURE; BONE DISEASES; HYPERTENSION; KIDNEY DISEASES; NEOPLASMS; INDUSTRIAL DISEASES; METAL POISONING; RESPIRATORY DISEASES; REVIEW; CADMIUM; FUMES; HEALTH HAZARDS; INDUSTRIAL ATMOSPHERES; INHALATION; MINERAL METABOLISM; OCCUPATIONAL HAZARDS; SMOKING; WATER POLLUTION; FOOD CONTAMINATION Bernard, A.; Lauwerys, R. 1984 Experientia 40(2):143-152				

Tissue	Cases Exposure Route	Range	Mean	General Information
9017 Umbilical cord	331	1-181 ppb	7+/-7 ppb	112 cases Nagoya, Japan, 1974-1978. Normal deliveries. AAS
ZINC; MERCURY; METHYLMERCURY; LEAD; CADMIUM; MANGANESE; COPPER; IRON; JAPAN; BLOOD; PLACENTA; UMBILICAL CORD; METALS; ENVIRONMENTAL EXPOSURE Tsuchiya, H.; Mitani, K.; Kodama, K.; Nakata, T. 1984 Archives of Environmental Health 39(1):11-17				

Tissue	Cases Exposure Route	Range	Mean	General Information
9018 Urine		a) 0.10-1.71 ug/L b) 0.24-1.84 ug/L c) 0.10-0.96 ug/L	a) 0.53 ug/L b) 0.62 ug/L c) 0.21 ug/L Geometric mean	a) Women in labor b) Controls, non-pregnant women matched for age and area of residence c) Newborns of mothers in a) Never occupationally exposed 18-40 yr old healthy women and healthy newborns, Milan, Italy AAS; Carbon Rod Atomization
BLOOD; URINE; ENVIRONMENTAL EXPOSURE; ITALY; ADULTS; NEWBORN; CADMIUM; TRANSPLACENTAL TRANSFER Alessio, L.; Dell'orto, A.; Calzaferri, G.; Buscaglia, M.; Motta, G.; Risso, M. 1984 Science of the Total Environment 34:261-266				

Tissue	Cases Exposure Route	Range	Mean	General Information
9019 Urine	a) 880 b) 96 c) 144	a) Not given b) Not given c) Not given	a) 1.16+/-1.03 ug b) 1.53+/-1.33 ug c) 1.30+/-1.06 ug /g creatinine	a) Active smelter workers b) Retirees and ex-employees of smelter c) Copper and gold miners, never employed in smelter Data also given for different job categories of smelter workers. Findings indicate that exposure to Cd containing fumes and dust and cigarette smoking can independently contribute to blood Cd levels AAS
BLOOD; URINE; OCCUPATIONAL EXPOSURE; ADULTS; CADMIUM; LEAD; ARSENIC; INDUSTRIAL PLANTS; SMELTERS; ZINC ORGANIC COMPOUNDS Lilis, R.; Valciukas, J.A.; Weber, J.P.; Fischbein, A.; Nicholson, W.J.; Campbell, C.; Malkin, J.; Selikoff, I.J. 1984 Environmental Research 33:76-96				

Cadmium

7440-43-9
Cd
AtW 112.40, MP 321 C, BP 765 C, VP 1 mm Hg at 394 C, 10 mm Hg at 486 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9020 Urine	1 Inhalation	a) 0.70-1.67 g/L b) 0.51-2.07 g/L c) 0.87-1.80 g/L d) 0.69-1.71 g/L e) 0.58-1.47 g/L f) 0.62-2.02 g/L g) 0.76-2.07 g/L	a) 1.17 g/L b) 1.86g/L c) 1.22 g/L d) 1.14 g/L e) 1.08 g/L f) 1.26 g/L g) 1.26 g/L	a) Day 1 b) Day 2 c) Day 3 d) Day 4 e) Day 5 f) Day 6 g) Day 7 Ranges of means. Smoker. On 5 Days, peaks at 10-11 AM. Diurnal and interday variations. For screening programs, 24-hr urine specimens should be used. Lab technician, Canada AAS
URINE; CANADA; MEASUREMENT METHODS; CADMIUM; SMOKING; DIURNAL VARIATIONS; DELIBERATE EXPOSURE Subramanian, K.S.; Meranger, J.E. 1984 Clinical Chemistry 30(6):1110-1111				

Tissue	Cases Exposure Route	Range	Mean	General Information
9021 Urine	1 Inhalation	Not applicable	102 nmol (1.1 ug/100 ml)	Subject sampled 48 hr after smelting 182 kg Pb for 24 hr in enclosed environment, died 72 hr later. Normal levels are <10 nmol (<0.11 ug/100 ml). Healthy 36 yr old AAS
BLOOD; BRAIN; HEART; INTESTINES; KIDNEYS; LIVER; LUNGS; MUSCLES; SKIN; SPLEEN; STOMACH; URINE; ENVIRONMENTAL EXPOSURE; UNITED KINGDOM; ADULTS; AUTOPSIES; METAL POISONING; CADMIUM; LEAD; INHALATION Taylor, A.; Jackson, M.A.; Patil, D.; Burston, J.; Lee, H.A. 1984 British Medical Journal 288:1270-1271				

Tissue	Cases Exposure Route	Range	Mean	General Information
9022 Urine	25 Ingestion	0.1-0.8 ug/d	0.4 ug/d	Samples collected over 6-day period. Metabolic balance studies showed dietary intake was correlated with Zn ($p<0.001$) but not N, Ca, Fe, Cu, or energy. Negative Cd balance in 11 subjects. Retention correlated with intake. Healthy, elderly, nonsmokers, 11 males, 12 females, age 69-85, England AAS
BLOOD SERUM; URINE; ENGLAND; CADMIUM; IRON; LEAD; DIETS; AGE; ENVIRONMENTAL EXPOSURE Bunker, V.W.; Lawson, M.S.; Delves, H.T.; Clayton, B.E. 1984 American Journal of Clinical Nutrition 39:803-806				

Cadmium
7440-43-9
Cd
AtW 112.40, MP 321 C, BP 765 C, VP 1 mm Hg at 394 C, 10 mm Hg at 486 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9028 Urine	a) 31 b) 10 c) 21 d) 29	a) 2.3+/-1.7-8.3+/-1.7 ug b) 12.8+/-1.9-14.9+/-2.1 ug c) 14.8+/-1.3-17.2+/-1.6 ug d) 9.9+/-1.7-16.7+/-3.2 ug /g creatinine	a) Not given b) Not given c) Not given d) Not given	a) Controls, non-exposed b) Patients with itai-itai disease - renal damage and bone lesions c) Patients suspected of having disease - renal damage, no obvious bone le d) Exposed - no bone or renal disorders, range of means a)-c) environmentally exposed. b)-d) significantly different from a) 50-70 yr old women AAS

URINE; BLOOD SERUM; ENVIRONMENTAL EXPOSURE; JAPAN; COPPER; CADMIUM; ZINC; KIDNEY DISEASES
Nogawa, K.; Yamada, Y.; Honda, R.; Tsuritani, S.; Kobayashi, E.; Ishizaki, M. 1984 Environmental Research 35:29-39

Tissue	Cases Exposure Route	Range	Mean	General Information
9024 Urine	a) Inhalation b) c)	a) Not given b) Not given c) Not given	a) <5 ug/l b) <5 ug/l c) 5 ug/l	a) Preemployment. 10/83 Smoker (1/2 pk tobacco/d) b) Same worker, 1/17/84 c) 2/2/84 41 yr old factory worker

BLOOD; URINE; OCCUPATIONAL EXPOSURE; ADULTS; CADMIUM; FUMES; INDUSTRIAL PLANTS; OCCUPATIONAL HAZARDS
Hughes, E.G. 1984 Lancet 2(8417/8):1467-1468

Tissue	Cases Exposure Route	Range	Mean	General Information
9026 Urine	33 Inhalation	a) 5-91 ug b) 10-13 ug c) 5-86 ug /g creatinine	a) Not given b) 11 ug c) 16 ug /g creatinine	a) 33 employees with cumulative time-weighted exposure from 15-1956 ug/cu m/yr, includes normal, abnormal renal function b) 23 of above, average cumulative time-weighted exposure 459 ug/cu m/yr, normal renal function c) 7 from a), average cumulative time-weighted exposure 1137 ug/cu m/yr, abnormal renal function Exposure below permissible level of 100 ug/cu m, still had renal dysfunction. Employees (mean age 50+/-1 yr), copper production plant, Michigan AAS

URINE; OCCUPATIONAL EXPOSURE; ADULTS; KIDNEY DISEASES; INDUSTRIAL MEDICINE; CADMIUM; INDUSTRIAL ATMOSPHERES; INHALATION; OCCUPATIONAL HAZARDS
Falck, F.Y.; Fine, L.J.; Smith, R.G.; McClellan, K.D.; Annesley, T.; England, B.; Schork, A.M. 1983 American Journal of Industrial Medicine 4:541-549

Cadmium

7440-43-9

Cd

AtW 112.40, MP 321 C, BP 765 C, VP 1 mm Hg at 394 C, 10 mm Hg at 484 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9026 Urine	1000	a) Not given b) Not given c) 0.432+/-2.7-1.163+/-2.3 ug/l Geometric Mean	a) 0.728+/-2.6 ug/l b) 0.863+/-2.7 ug/l c) Not given Geometric mean	a) Males b) Females c) Both sexes, range of means by age Values specific-gravity-adjusted. Levels increase with age to the 60's and decrease in the 70's. Data also given for age-sex and creatinine adjusted. 20-74 yr olds from selected counties in 6 states AAS

URINE; ENVIRONMENTAL EXPOSURE; ARKANSAS; ILLINOIS; INDIANA; MICHIGAN; NEW JERSEY; NEW YORK; OHIO; PENNSYLVANIA; TEXAS; ADULTS; CADMIUM

Kowal, N.E.; Zirkes, M. 1983 Journal of Toxicology and Environmental Health 11:607-624

Tissue	Cases Exposure Route	Range	Mean	General Information
9027 Urine	a) 114 b) 101 c) 48 d) 38	a) 0.1-1.9 ug/g creatinine b) 0.1-1.9 ug/g creatinine c) 0.1-1.4 ug/g creatinine d) 1.1-1.9 ug/g creatinine	a) 0.50+/-0.45 ug b) 0.46+/-0.38 ug c) 0.30+/-0.27 ug d) 0.40+/-0.36 ug /g creatinine	a) Unexposed male factory workers b) Exposed male workers c) Unexposed female factory workers d) Exposed female workers Levels considered within normal range. Exposure was to Hg vapor. Male and female factory workers, ages 30.9 and 29.9 yr, exposure durations 4.8 and 7 yr. Matched controls. Belgium AAS

MERCURY; BLOOD; URINE; OCCUPATIONAL EXPOSURE; SEX; BELGIUM; HEALTH HAZARDS; OCCUPATIONAL HAZARDS; INHALATION; LEAD; CADMIUM; ZINC; INDUSTRIAL ATMOSPHERES; BIOINDICATORS; NEUROLOGIC MANIFESTATIONS

Roels, H.; Gennart, J.-P.; Lauwerys, R.; Buchet, J.P.; Malchaire, J.; Bernard, A. 1986 American Journal of Industrial Medicine 7:45-71

Tissue	Cases Exposure Route	Range	Mean	General Information
9028 Urine				Review. Levels, body burdens, and health effects resulting from environmental, dietary, smoking and occupational exposures.

BLOOD; LUNGS; URINE; GASTROINTESTINAL TRACT; LIVER; KIDNEYS; HAIR; SWEAT; MILK; SALIVA; CONSUMER EXPOSURE; ENVIRONMENTAL EXPOSURE; OCCUPATIONAL EXPOSURE; BONE DISEASES; HYPERTENSION; KIDNEY DISEASES; NEOPLASMS; INDUSTRIAL DISEASES; METAL POISONING; RESPIRATORY DISEASES; REVIEW; CADMIUM; FUMES; HEALTH HAZARDS; INDUSTRIAL ATMOSPHERES; INHALATION; MINERAL METABOLISM; OCCUPATIONAL HAZARDS; SMOKING; TRANSPLACENTAL TRANSFER; WATER POLLUTION; FOOD CONTAMINATION

Hallenbeck, W.H. 1984 Experientia 40(2):136-142

Cadmium
7440-43-9
Cd
AtW 112.40, MP 321 C, BP 765 C, VP 1 mm Hg at 394 C, 10 mm Hg at 486 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9020 Urine	37 Inhalation	a) Not given b) Not given c) Not given	a) 8.2 nmol b) 16.5 nmol c) 27.4 nmol /mmol creatinine	a) 0-10 yr b) 10-20 yr c) >20 yr Occupational exposures, years of employment Smelter workers N.A
ADULTS; KIDNEY DISEASES; KIDNEYS; LIVER; URINE; COMPARATIVE EVALUATIONS; INDUSTRIAL ATMOSPHERES; OCCUPATIONAL EXPOSURE Gomperts, D.; Fletcher, J.G.; Perkins, J.; Smith, N.J.; Chettle, D.R.; Mason, H.; Scott, M.C.; Topping, M.D.; Blindt, M. 1983 Lancet 1(8335):1185-1187				

Tissue	Cases Exposure Route	Range	Mean	General Information
9080 Urine	a) 62 b) 65 c) 109 Ingestion Inhalation	a) Not given b) Not given c) Not given	a) 8.6+/-5.6 ug/l b) 3.0+/-2.8 ug/l c) 11.9+/-9.8 ug/l	a) Annaka district, Gunma Prefecture. Air from electric Zn refinery. Levels in soil 2.4 ug/g, rice 0.25 ug/g b) Hitachi district, Ibaragi Prefecture. Cd from Cu refinery. Levels in rice 0.23 ug/g c) Fuchu district, Toyama Prefecture. Water with Cd from Pb mine and refinery 55 mi upstream. Levels in sludge 5 ug/g, rice 0.52 ug/g. Japan AAS
JAPAN; URINE; COMPARATIVE EVALUATIONS; CADMIUM; METALS; AIR POLLUTION; BIOACCUMULATION; FOOD CONTAMINATION; INDUSTRIAL EMISSIONS; INDUSTRIAL POLLUTION ; INHALATION; LAND POLLUTION; MINING; POPULATION EXPOSURE; RICE; SOILS; WATER POLLUTION Nomiyama, K.; Yotoriyama, M.; Nomiyama, H. 1983 Archives of Environmental Contamination and Toxicology 12:147-150				

Tissue	Cases Exposure Route	Range	Mean	General Information
9081 Urine	a) 65 b) 64	a) Not given b) Not given	a) 43.1% b) 7.8%	a) Exposed workers with levels >2 ug/l b) Unexposed workers with levels >2 ug/l Exposed smelter workers, electroplaters, welders. Unexposed factory and mine workers. Australia NA
AUSTRALIA ; LIVER; BLOOD; URINE; IN VIVO ANALYSIS; CADMIUM; INDUSTRIAL AREAS; INDUSTRIAL POLLUTION; HEALTH HAZARDS; INDUSTRIAL PLANTS; SMELTERS; OCCUPATIONAL EXPOSURE Baddeley Thomas, B.J.; Thomas, B.W.; Summers, V. 1983 British Journal of Radiology 56:449-451				

Tissue	Cases Exposure Route	Range	Mean	General Information
9082 Urine	9	0.35+/-0.06-2.74+/-0.06 ng/ml	Not given	Random samples. Volunteers, laboratory personnel AAS
URINE; CADMIUM; LEAD; ENVIRONMENTAL EXPOSURE; ADULTS; MEASUREMENT METHODS; BIOLOGICAL MONITORING Subramanian, K.S.; Meranger, J.-C.; MacKeen, J.E. 1983 Analytical Chemistry 55:1064-1067				

Cadmium
7440-43-9
Cd
AtW 112.40, MP 321 C, BP 765 C, VP 1 mm Hg at 394 C, 10 mm Hg at 486 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9033 Urine	30	Not given	14.92+/-7.77 ug/g creatinine	Patients with renal tubular damage from exposure to Cd exposure. Inhabitants of Kakehashi River basin in Ishikawa Prefecture, 56-86 yr old, 9 males, 21 females. Increased serum parathyroid hormone and consequent bone damage. Renal tubule atrophy AAS

URINE; ENVIRONMENTAL EXPOSURE; JAPAN; ADULTS; BONE DISEASES; KIDNEY DISEASES; CADMIUM; HEALTH HAZARDS; MINERAL METABOLISM; OCCUPATIONAL HAZARDS; POPULATION EXPOSURE
Nogawa, K.; Kobayashi, E.; Yamada, Y.; Honda, R.; Kido, T.; Tsuritani, I.; Ishizaki M. 1984 International Archives of Occupational and Environmental Health 54:187-193

Tissue	Cases Exposure Route	Range	Mean	General Information
9034 Urine	94	a) 1.3-38.4 ug b) 8.0-36.3 ug /g creatinine	a) 13.3+/-8.6 ug b) 17.0+/-7.2 ug /g creatinine	a) Normal beta2-microglobulinuria, 66 cases b) Increased beta2-microglobulinuria, 28 cases Correlation of Cd and exposure, metallothionein and beta2-microglobulin in urine discussed. Past and present workers, 37.7-65.6 yr, in two Belgian Cd smelters Renal dysfunction AAS

URINE; BLOOD; OCCUPATIONAL EXPOSURE; BELGIUM; ADULTS; KIDNEY DISEASES; COMPARATIVE EVALUATIONS; CADMIUM; INDUSTRIAL PLANTS
Roels, H.; Lauwerys, R.; Buchet, J.P.; Bernard, A.; Garvey, J.S.; Linton, H.J. 1983 International Archives of Occupational and Environmental Health 52:159-166

Tissue	Cases Exposure Route	Range	Mean	General Information
9035 Urine	72 Inhalation	a) 0.3-5.0 ug b) 0.2-2.8 ug c) 0.2-3.0 ug d) 0.3-3.2 ug e) 0.3-1.9 ug f) 0.2-2.8 ug g) 0.1-2.3 ug h) 0.1-1.5 ug /g creatinine	a) 1.0+/-1.02 ug b) 0.9+/-0.56 ug c) 1.2+/-0.79 ug d) 1.2+/-0.79 ug e) 0.9+/-0.58 ug f) 1.1+/-0.74 ug g) 1.0+/-0.62 ug h) 0.9+/-0.47 ug /g creatinine	a) Controls, 0 wks, 27 cases b) Controls, 16 wks, 27 cases c) Vitamin C treatment, 0 wks, 25 cases d) Vitamin C treatment, 16 wks, 25 cases e) Controls, 0 wks, 10 cases f) Controls, 8 wks, 10 cases g) Zinc treatment, 0 wks, 10 cases h) Zn treatment, 8 wks, 10 cases Vitamin C dose was 1 g/d, 5 d/wk. Zinc as Zn glutamate dose was 60 mg/d, 5 d/wk. No significant difference between control and treatment groups. 21-64 yr old workers at primary Pb smelter, 0.5-42 years exposure AAS

BLOOD; URINE; OCCUPATIONAL EXPOSURE; ADULTS; LEAD POISONING; METAL POISONING; INDUSTRIAL MEDICINE; CADMIUM; LEAD; MERCURY; ZINC; BIOACCUMULATION; HEALTH HAZARDS; INDUSTRIAL ATMOSPHERES; INDUSTRIAL PLANTS; INHALATION; OCCUPATIONAL HAZARDS; VITAMINS; VITAMIN C
Lauwerys, R.; Roels, H.; Buchet, J.-P.; Bernard, A.A.; Verhoeven, L.; Konings, J. 1983 Journal of Occupational Medicine 25(9): 668-676

Cadmium

7440-43-9

Cd

AtW 112.40, MP 321 C, BP 765 C, VP 1 mm Hg at 394 C, 10 mm Hg at 486 C

Tissue	Cases / Exposure Route	Range	Mean	General Information
9076 Urine				Review. Metabolism and toxicity under conditions of excessive acute or chronic exposure.

LIVER; LUNGS; GASTROINTESTINAL TRACT; ERYTHROCYTES; KIDNEYS; PANCREAS; THYROID GLANDS; SALIVARY GLANDS; URINE; LYMPHOCYTES; BLOOD; CONSUMER EXPOSURE; ENVIRONMENTAL EXPOSURE; OCCUPATIONAL EXPOSURE; BONE DISEASES; HYPERTENSION; KIDNEY DISEASES; NEOPLASMS; INDUSTRIAL DISEASES; METAL POISONING; RESPIRATORY DISEASES; REVIEW; CADMIUM; FUMES; HEALTH HAZARDS; INDUSTRIAL ATMOSPHERES; INHALATION; MINERAL METABOLISM; OCCUPATIONAL HAZARDS; SMOKING; WATER POLLUTION; FOOD CONTAMINATION

Bernard, A.; Lauwerys, R. 1984 Experientia 40(2):143-152

Calcium

7440-70-2

Ca

AtW 40.08, MP 850 C, BP 1440 C, VP 10 mm Hg at 982 C

Tissue	Cases / Exposure Route	Range	Mean	General Information
9047 Aorta	a) 3 b) 6 c) 7	a) 26,000-41,000 ppm b) 3,000-6,900 ppm c) Not given Dry wt	a) Not given b) Not given c) 1,700+/-4,200 ppm Dry wt	a) Sclerotic aorta from metal-workers b) Normal aorta from metal-workers c) Normal aorta from non metal-workers 45-66 yr old workers. Autopsies, Japan, 1976-1977. Employed 7-32 yr ES

AORTA; VERTEBRAE; BONES; ENVIRONMENTAL EXPOSURE; OCCUPATIONAL EXPOSURE; JAPAN; AUTOPSIES; CADAVERS; CARDIOVASCULAR DISEASES; MINERALS; BIOACCUMULATION; DIETS; FOODS; MINERAL DEPOSITS; CALCIUM; PHOSPHORUS; IRON; MAGNESIUM; ZINC; ALUMINUM; COPPER; CADMIUM; LEAD; NICKEL; VANADIUM; CHROMIUM; MANGANESE; SILICON; TIN; TITANIUM; STRONTIUM

Tsuchiya, H. 1984 Archives of Environmental Contamination and Toxicology 13:119-127

Tissue	Cases / Exposure Route	Range	Mean	General Information
9034 Blood, cells	a) 45 b) 167 c) 121	a) Not given b) 167+/-24-169+/-36 nM c) 121+/-32-138+/-8 nM	a) 168+/-16 nM b) Not given c) Not given	a) Normotensives b) Patients with essential hypertension, divided into 3 therapeutic groups c) Groups in b), after 4 wk therapy with either Ca-entry blocker or beta-adrenoceptor blocker or diuretic In platelets. Ranges of means. Hypertensive and normotensive subjects, Switzerland Fluorescent QO
9030 Blood, plasma	a) 30 b) 8 c) 23	a) Not given b) Not given c) Not given	a) 2.30+/-0.10 nmol/l b) 2.27+/-0.80 nmol/l c) 2.18+/-0.15 nmol/l	a) Normotensive subjects b) Patients with borderline hypertension c) Untreated patients with essential hypertension Hypertensive and normotensive subjects, Switzerland Fluorescence

PLATELETS; DELIBERATE EXPOSURE; SWITZERLAND; CARDIOVASCULAR DISEASES; HYPERTENSION; ANTIHYPERTENSIVE AGENTS; BETA BLOCKER; DIURETICS; CALCIUM; BLOOD PRESSURE

Erne, P.; Bolli, P.; Buergisser, E.; Buehler, F.R. 1984 New England Journal of Medicine 310(17):1084-1088

Calcium
7440-70-2
Ca
AtW 40.08, MP 850 C, BP 1440 C, VP 10 mm Hg at 983 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9040 Blood, plasma	14 Ingestion	a) Not given b) Not given c) Not given d) Not given e) Not given f) Not given g) Not given h) Not given	a) 1.93+/-0.38 mmol b) 2.43+/-0.03 mmol c) 2.68+/-0.13 mmol d) 2.45+/-0.19 mmol e) 1.94+/-0.12 mmol f) 2.32+/-0.12 mmol g) 2.56+/-0.08 mmol h) 2.24+/-0.08 mmol S.E.	a) Infants fed mothers' milk, start of study, 7 cases b) At 1 wk, 7 cases c) At 2 wk, 6 cases d) At 4 wk, 5 cases e) Infants fed formula, start of study, 6 cases f) At 1 wk, 7 cases g) At 2 wk, 5 cases h) At 4 wk (+ supplements $NaHCO_3$, Ca-lactate), 5 cases Significant increase over 4 wk period ($p<0.05$) in both groups. Premature infants, birth wt <1.5 kg, mean gestational age 28 wk, Canada AAS; ES

PREMATURE INFANTS; CANADA; NUTRITIONAL DEFICIENCIES; BLOOD PLASMA; MILK; COMPARATIVE EVALUATIONS; CALCIUM; MAGNESIUM; MINERALS; PHOSPHORUS; POTASSIUM; SODIUM; FOODS; LACTATION; DELIBERATE EXPOSURE
Atkinson, S.A.; Radde, I.C.; Anderson, G.H. 1983 Journal of Pediatrics 102(1):99-106

Tissue	Cases Exposure Route	Range	Mean	General Information
9041 Blood, plasma		a) Not given b) Not given c) Not given	a) 93.0+/-5.0 ug/mL b) 93.0+/-7.0 ug/mL c) 92.0+/-4.0 ug/mL	a) Insulin-treated diabetics b) Non-insulin-treated diabetics c) Control non-diabetics Collected after overnight fasting. Differences not significant. 18-75 yr olds, Oxford, England NA; RAS

BLOOD PLASMA; ENGLAND; DIABETES; METABOLISM; MINERAL METABOLISM; ALUMINUM; ANTIMONY; ARSENIC; BARIUM; BROMINE; CADMIUM; CALCIUM; CESIUM; CHROMIUM; COBALT; COPPER; IODINE; IRON; LEAD; MAGNESIUM; MANGANESE; MERCURY; MOLYBDENUM; NICKEL; RUBIDIUM; SCANDIUM; SELENIUM; SILVER; TIN; VANADIUM; ZINC
Ward, N.I.; Pim, B. 1984 Biological Trace Element Research 6:469-487

Tissue	Cases Exposure Route	Range	Mean	General Information
9042 Blood, serum	187 Ingestion	a) Not given b) 80+/-5.85+/-3 mg/L c) 93+/-4.04+/-5 mg/L d) Not given S.E.	a) 98+/-1 mg/L b) Not given c) Not given d) 68 mg/L S.E.	a) 30 controls b) 109 patients with hypertension, acute myocardial ischemia, acute myocardial infarction c) 48 others d) 54 from b) with infarction, 2'-30 hr after last chest pains Significant differences between a) and b), d) and initial levels. Range of means in b) and c), d) estimated from graph Controls from group 30-56 yr olds, 24% with family history of ischemia. 93 males, 16 females (diseases in b)) from 47-53 yr olds, 60% smokers, 30% family history of ischemia. Titration

BLOOD SERUM; HEART DISEASES; HYPERTENSION; TRACE ELEMENTS; COPPER; ZINC; IRON; NICKEL; COBALT; SODIUM; POTASSIUM; CALCIUM; MAGNESIUM; PAKISTAN; COMPARATIVE EVALUATIONS; CHOLESTEROLS
Khan, S.N.; Rahman, M.A.; Samad, A. 1984 Clinical Chemistry 30(5):644-648

Calcium
7440-70-2
Ca
AtW 40.08, MP 850 C, BP 1440 C, VP 10 mm Hg at 988 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9048 Blood, serum	1	10.1 mg/dL-11.8 mg/dL	Not applicable	Levels over 6 mo of stopping and starting treatment, 650 mg Al(OH)3 3X/d 56 yr old hemodialysis patient Hypercalcemia AAS
BLOOD SERUM; BONES; DELIBERATE EXPOSURE; CASE HISTORIES; BONE DISEASES; KIDNEY DISEASES; BIOPSIES; ALUMINUM; CALCIUM; BIOACCUMULATION; DRUGS Verbeelen, D.; Smeyers-Verbeke, J.; Sennesael J.; Massart, D.L. 1983 Lancet 1(8334): 1168-1169				

Tissue	Cases Exposure Route	Range	Mean	General Information
9044 Blood, serum	8 Ingestion	a) Not given b) 11.6-12.4 mg/dL c) Not given d) Not given e) Not given f) Not given g) 11.8-12.2 mg/dL h) Not given	a) 8.7 mg b) Not given c) 12.7 mg d) 7.4 mg e) 11.8 mg f) 9.7 mg g) Not given h) 11.6 mg /dL	a) 16 d old, prune-belly syndrome, renal dysplasia. Before Al therapy b) Same case, 6 wk-4.5 mo old, on 2 different Al doses, 869 mg/kg/d, at 3 mo 286 mg/kg/d c) Same case, 5 mo old, 180 mg Al/kg/d and 1000 units ergocalciferol/d d) 20 d old, renal dysplasia. Before Al therapy e) Same case, 6 mo old, 540 mg Al/kg/d and 1000 units ergocalciferol f) 26 d old, renal cortical necrosis. Before Al therapy g) Same case, 6-12 mo old, 212 mg Al/kg/d h) Same case, 13 mo old, 3000 IU ergocalciferol/d in preceding mo. Varying Al, max stated 212 mg.d, min 120 mg/d for unspecified time. Infants with kidney disease Osteomalacia. Al accumulation in bone.
BLOOD SERUM; DELIBERATE EXPOSURE; INFANTS; CHILDREN; KIDNEY DISEASES; DRUGS; ALUMINUM; CALCIUM; CASE HISTORIES Andreoli, S.P.; Bergstein, J.M.; Sherrard, D.J. 1984 New England Journal of Medicine 310(17):1079-1084				

Tissue	Cases Exposure Route	Range	Mean	General Information
9045 Blood, serum	32	a) 8.9-9.6 mg/dl b) 7.8-8.8 mg/dl c) 9.0-9.5 mg/dl d) 7.9-8.9 mg/dl	a) 9.4+/-0.2 mg/dl b) 8.4+/-0.3 mg/dl c) 9.3+/-0.2 mg/dl d) 8.2+/-0.3 mg/dl	a) Initial level, 18 patients receiving Mg IM b) At 12 hr c) Initial level, 14 patients receiving Mg IV d) At 12 hr 16-25 yr old preeclamptic patients, 34-40 wk pregnant, Memphis, TN AAS
BLOOD SERUM; DELIBERATE EXPOSURE; ADULTS; ANTICONVULSANTS; COMPARATIVE EVALUATIONS; MAGNESIUM; PREGNANCY Sibai, B.M.; Graham, J.M.; McCubbin, J.H. 1984 American Journal of Obstetrics and Gynecology 150(6):728-733				

Calcium
7440-70-2
Ca
AtW 40.08, MP 850 C, BP 1440 C, VP 10 mm Hg at 982 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9046 Blood, serum	7	a) Not given b) Not given	a) 8.6+/-0.2 mg/dl b) 7.6+/-0.2 mg/dl	a) Pretreatment b) 8 hr Doses of magnesium sulfate: 6 g over 30 min followed by 2 g/hr. Normal level in pregnancy 7.9-9.9 mg/dl. Ionized calcium also decreased. Parathyroid hormone decreased for first 30 min, returned to baseline after 180 min. No symptoms of hypocalcemia. 23+/-2 yr olds in premature labor (mean gestation 27+/-1 wk) with no other pregnancy complications AAS
BLOOD SERUM; DELIBERATE EXPOSURE; ADULTS; CALCIUM; MAGNESIUM; PREGNANCY Cheist, I.N.; Steinberg, S.F.; Tropper, P.J.; Fox, H.E.; Segre, G.V.; Bilezikian, J.P. 1984 New England Journal of Medicine 310(19):1221-1225				

Tissue	Cases Exposure Route	Range	Mean	General Information
9047 Bone	1	Not given	92000+/-9200 ppm Dry wt	Lumbar vertebrae (n=5). Chromate plating worker, employed 7 yr, died at age 66, 30 yr after changing jobs ES
AORTA; VERTEBRAE; BONES; ENVIRONMENTAL EXPOSURE; OCCUPATIONAL EXPOSURE; JAPAN; AUTOPSIES; CADAVERS; CARDIOVASCULAR DISEASES; MINERALS; BIOACCUMULATION; DIETS; FOODS; MINERAL DEPOSITS; CALCIUM; PHOSPHORUS; IRON; MAGNESIUM; ZINC; ALUMINUM; COPPER; CADMIUM; LEAD; NICKEL; VANADIUM; CHROMIUM; MANGANESE; SILICON; TIN; TITANIUM; STRONTIUM Tereoka, H. 1984 Archives of Environmental Contamination and Toxicology 13:119-127				

Tissue	Cases Exposure Route	Range	Mean	General Information
9048 Breast	22	a) Not given b) Not given	a) 257.5+/-85.7 ug/g b) 671.7+/-274.5 ug/g	a) Normal tissue b) Neoplastic Dry wt, 5 samples, p=0.0001 Patients with primary breast carcinomas, samples of normal and neoplastic tissue obtained at time of mastectomy X-ray fluorescence
BREAST; CALCIUM; VANADIUM; CHROMIUM; MANGANESE; IRON; NICKEL; COPPER; ZINC; ARSENIC; SELENIUM; BROMINE; RUBIDIUM; STRONTIUM; MOLYBDENUM; LEAD; MERCURY; NEOPLASMS Rish, S.L.; Sky-Peck, H.H. 1984 Cancer Research 44:5290-5294				

Calcium

7440-70-2
Ca
AtW 40.08, MP 850 C, BP 1440 C, VP 10 mm Hg at 982 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9040 Hair	a) 69 b) 21 c) 6 d) 18	a) Not given b) Not given c) Not given d) Not given	a) 1435 (1.8) ug/g b) 1427 (1.6) ug/g c) 1167 (1.9) ug/g d) 1588 (1.5) ug/g Geometric means	a) Total, unwashed hair samples b) Hair pieces c) Needle-pads d) Others (undefined) In unwashed samples, no significant difference between sample types or dates of cutting (1880-1969). After washing (non-ionic SAX), no significant difference between 1911-1968 samples and 1981-1983. Japanese women, 1981-1983 samples from 22 workers at National Institute of Environmental Studies Atomic emission spectrometry; AAS

HAIR; ENVIRONMENTAL EXPOSURE; JAPAN; COMPARATIVE EVALUATIONS; CALCIUM; COPPER; IRON; LEAD; MAGNESIUM; MANGANESE; MERCURY; MERCURY ORGANIC COMPOUNDS; METALS; MINERALS; PHOSPHORUS; POTASSIUM; SODIUM; STRONTIUM; TRACE ELEMENTS; ZINC; OCCUPATIONAL EXPOSURE

Suzuki, T.; Hongo, T.; Morita, M.; Yamamoto, R. 1986 Science of the Total Environment 50:81-91

Tissue	Cases Exposure Route	Range	Mean	General Information
9040 Hair	a) 33 b) 6 c) 5 d) 11 e) 10	a) 0.5-1.0% b) 0.7-1.1% c) 1.0-3.0% d) 1.0-10.0% e) 0.7-1.6%	a) 0.6% b) 1.0% c) 1.9% d) 4.7% e) 1.3%	a) 1-10 yr olds, rural b) 10-20 yr olds, rural c) 20 yr olds, rural d) 15-25 yr olds, different areas of country e) All age groups, different areas of country 15-25 yr olds had highest levels of trace elements. Residents of Sri Lanka AAS

HAIR; ENVIRONMENTAL EXPOSURE; SRI LANKA; CHILDREN; ADULTS; LEAD POISONING; METAL POISONING; CALCIUM; MAGNESIUM; IRON; MANGANESE; COPPER; ZINC; LEAD; AUTOMOTIVE; AIR POLLUTION; BIOACCUMULATION; HEALTH HAZARDS; LAND POLLUTION; POPULATION EXPOSURE; RURAL AREAS; URBAN AREAS; AGE

Tissue	Cases Exposure Route	Range	Mean	General Information
9040 Hair	6	a) 300-4200 ug/g b) 0-3200 ug/g c) 100-1000 ug/g d) 0-700 ug/g e) 100-800 ug/g f) 250-1700 ug/g Estimated from figure	a) 500 ug/g b) 160 ug/g c) 300 ug/g d) 270 ug/g e) 340 ug/g f) 30 ug/g (sic)	a) 0-40 cm from scalp, 7 yr old female b) 0-40 cm from scalp, 4 yr old female c) 0-30 cm from scalp, 7 yr old female d) 0-18 cm from scalp, 9 yr old female e) 0-15 cm from scalp, 2 yr old male f) 0-45 cm from scalp, 40 yr old female Range from total length, mean from 1st 10 cm from scalp. General increase in levels from scalp to tip. Japan NA

HAIR; ENVIRONMENTAL EXPOSURE; JAPAN; ADULTS; CHILDREN; COMPARATIVE EVALUATIONS; BROMINE; CALCIUM; CHLORINE; COPPER; IODINE; MAGNESIUM; MANGANESE; MERCURY; SELENIUM; ZINC; BIOINDICATORS

Nakano, M.; Suzuki-Yasumoto, M.; Tanaka, S. 1984 Science of the Total Environment 38:41-54

Calcium
7440-70-2
Ca
AtW 40.08, MP 850 C, BP 1440 C, VP 10 mm Hg at 985 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9087 Milk	7	a) Not given b) Not given c) Not given	a) 7.45+/-0.90 mmol b) 6.30+/-0.60 mmol c) 6.75+/-0.50 mmol S.E.	a) 6-8 days postpartum b) 13-15 days postpartum c) 26-28 days postpartum Mothers of premature infants. Infant birth wt <1.5 kg, mean gestational age 28 wk, Canada AAS; BS

PREMATURE INFANTS; CANADA; NUTRITIONAL DEFICIENCIES; BLOOD PLASMA; MILK; COMPARATIVE EVALUATIONS; CALCIUM; MAGNESIUM; MINERALS; PHOSPHORUS; POTASSIUM; SODIUM; FOODS; LACTATION; DELIBERATE EXPOSURE

Atkinson, S.A.; Radde, I.C.; Anderson, G.H. 1983 Journal of Pediatrics 102(1):99-106

Tissue	Cases Exposure Route	Range	Mean	General Information
9065 Semen	a) 36 b) 28	a) 24-28 mg % b) 7.5-55.0 mg %	a) Not given b) 17.6+/-6.9 mg %	a) Fertile controls b) Infertile patients Abnormal sperm motility and morphology AAS

CALCIUM; MAGNESIUM; ZINC; INDIA; ADULTS; SEMEN; SPERM

Pandy, V.K.; Parmeshwaran, M.; Soman, S.D.; Dacosta, J.C., 1983, Science of the Total Environment, 27:49-52

Tissue	Cases Exposure Route	Range	Mean	General Information
9084 Urine	66 Ingestion	a) Not given b) Not given c) Not given d) Not given e) Not given, adults f) Not given	a) 2.64+/-1.18 mmol b) 2.94+/-1.24 mmol c) 2.79+/-1.18 mmol d) 5.75+/-1.91 mmol e) 6.01+/-2.50 mmol f) 5.30+/-2.48 mmol /24 hr	a) Volunteers b) 20 males c) 16 females d) Stone-formers e) 11 Males f) 7 females Diet contained 400 mg Ca/d. Significant correlation between urinary excretion of Ca and Na in normal volunteers 38 healthy volunteers, normal renal function, mean age 31.3+/-11.9 yr, 16 recurrent stone formers, no demonstrable cause, mean age 28.6+/-10.5 yr

URINE; AUSTRALIA; ADULTS; CALCIUM; SODIUM; DELIBERATE EXPOSURE; DIETS;

Babto, J.; Powell, M.J.; Breidahl, M.J.; Gurr, F.W. 1984 Medical Journal of Australia 140:354-356

Calcium
7440-70-2
Ca
AtW 40.08, MP 850 C, BP 1440 C, VP 10 mm Hg at 982 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9064 Urine	a) 28 b) 42	a) 4-11 mg b) Not given /kg/24 hr	a) 5.82+/-0.36 mg b) 1.68+/-0.64 mg /kg/24 hr	a) Hypercalciuric, mean age 7.04+/-0.64 yr b) Normal Ca excretion, mean age 8.88+/-0.48 yr Children with hematuria, Memphis, TN AAS

URINE; TENNESSEE; CHILDREN; CALCIUM;
Stapleton, F.B.; Roy, S., III; Noe, H.N.; Jerkins, G. 1984 New England Journal of Medicine 310(21):1345-1348

Tissue	Cases Exposure Route	Range	Mean	General Information
9066 Urine	a) 7 b) 7 c) 8 Ingestion	a) Not given b) Not given c) Not given	a) 187+/-21.6 mg/d b) 284+/-35.2 mg/d c) 216+/-36.0 mg/d	a) Low intake, 250 mg/d b) Normal intake, 660 mg/d c) High intake, 2026 mg/d Pooled from 6 6-day study periods. Ca gluconate tablets added to constant metabolic diet for high intake. 37-71 yr old ambulatory patients, good physical condition, research ward, controlled diets, Illinois AAS

URINE; DELIBERATE EXPOSURE; ILLINOIS; PHOSPHORUS; CALCIUM; METABOLISM; MINERAL METABOLISM
Spencer, H.; Kramer, L.; Osis, D. 1984 American Journal of Clinical Nutrition 40:219-226

Tissue	Cases Exposure Route	Range	Mean	General Information
9067 Urine	9	a) Not given b) Not given	a) 166+/-53 mg/d b) 178+/-45 mg/d	a) Day of 6 mi run b) Non-run day No significant difference ($p<0.05$). Runners fasted 10 hr before and 2 hr after run. Also measured phosphate. 28-46 yr old runners AAS

BLOOD SERUM; URINE; CALCIUM; CHROMIUM; COPPER; POTASSIUM; SODIUM; ZINC; TRACE ELEMENTS; ADULTS
Anderson, R.A.; Polansky, M.M.; Bryden, N.A. 1984 Biological Trace Element Research 6:327-336

Calcium
7440-70-2
Ca
AtW 40.08, MP 850 C, BP 1440 C, VP 10 mm Hg at 982 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9068 Urine	12 Ingestion	a) Not given b) Not given c) Not given d) Not given	a) 6.80 mEq/24 hr b) 18.84 mEq/24 hr c) 8.55 mEq/24 hr d) 11.06 mEq/24 hr	a) Predose, 75 mEq as monocalcium citrate b) Postdose c) Predose, 75 mEq as calcium carbonate d) Postdose Increases in output of Mg, Na, reduced output of P after doses. Healthy graduate and/or medical students, 4 hyposecretors of acid and 8 with varying degrees of gastric secretion of acid. AAS
ADULTS; URINE; COMPARATIVE EVALUATIONS; CALCIUM; DELIBERATE EXPOSURE Hunt, J.N.; Johnson, C. 1963 Digestive Diseases and Sciences 28(5):417-421				

Calcium, isotope of mass 47
14391-99-2
Ca

Tissue	Cases Exposure Route	Range	Mean	General Information
9059 Blood	a) 2 b) 1 Injection	a) <1%-<0.1% b) <1%->0.1%	a) Not given b) Not given	a) Measured 0-220, 226 hr dosages 1.29-1.35 uCi IV b) 0-226 hr dose 1.10 uCi IV Estimated from graph. 20-58 yr old male volunteers, ht 1.52-1.78 m, wt 59.0-70.5 kg Radiometry
9060 Body	a) 1 b) 2 Injection	a) 96-47% b) 95-37% % dose retained	a) Not given b) Not given	a) Measured 20-436 hr dose 1.29 uCi IV b) 20-420 hr dosages 1.10-1.35 uCi IV Estimated from graph. 20-58 yr old male volunteers, ht 1.52-1.78 m, wt 59.0-70.5 kg Radiometry
9061 Bone	8 Injection	Not given	7.5%	Percentage of contemporary whole-body content. 10 d post injection. Dosage 1.10-1.35 uCi IV. 20-58 yr old male volunteers, ht 1.52-1.78 m, wt 59.0-70.5 kg Radiometry
LEAD; CALCIUM; RADIONUCLIDES; BONES; BLOOD; RADIOISOTOPES; BODY; LIVER; DELIBERATE EXPOSURE; UNITED KINGDOM Heard, M.J.; Chamberlain, A.C. 1984 Health Physics 47(6):857-865				

Carbon disulfide
75-15-0
C-52
MW 76.14, MP -110.8 C, BP 46.5 C at 760 mm Hg, VP 360 mm Hg at 25 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9062 Milk				Review. Levels after occupational exposures to trace metals, solvents, and halogenated hydrocarbons, discussed in terms of milk partition factors, potential infant exposures, possible health effects.

MILK; ENVIRONMENTAL EXPOSURE; ADULTS; REVIEW; MERCURY; LEAD; DDT; DIELDRIN; POLYCHLORINATED BIPHENYLS; POLYBROMINATED BIPHENYLS; CHROMIUM; CADMIUM; HEPTACHLOR EPOXIDE; OXYCHLORDANE; BIOACCUMULATION; LACTATION; HEALTH HAZARDS
Wolff, M.S. 1983 American Journal of Industrial Medicine 4:259-281

Carbon monoxide
630-08-0
C-61
MW 28.01, MP -205 C, BP -191.5 C, VP 10 mm Hg at -216 C, 100 mm Hg at -205.7 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9060 Blood	2 Inhalation	a) Not applicable b) Not applicable c) Not applicable d) Not applicable	a) 6.2% b) 6.2% c) 5.1% d) 2.5%	a) 4 hr after leaving a room with kerosene heater b) Next morning, 6-8 hr after leaving room where he slept all night with heater outside door c) 1 hr after receiving 100% oxygen d) Mother, 7.5 hr after leaving heater environment Measured as carboxyhemoglobin. Acute level could have been >15% 21 day old healthy black male. Nonsmoking mother, Philadelphia, PA Lethargy, vomiting, perioral cyanosis, shallow respirations

BLOOD; CONSUMER EXPOSURE; PENNSYLVANIA; INFANTS; ADULTS; CARBON MONOXIDE; FUMES; ENVIRONMENTAL EXPOSURE
O'Sullivan, B.P. 1983 Journal of Pediatrics 103(2):249-250

Tissue	Cases Exposure Route	Range	Mean	General Information
9064 Blood	a) 10 c) 7	a) 0.14+/-0.03-0.19+/-0.04 mL/100mL b) 0.17+/-0.04-0.19+/-0.03 mL/mL c) 0.91+/-0.49-0.94+/-0.49 mL/100mL	a) Not applicable b) Not applicable c) Not applicable	a) Healthy, premature ingants b) Nonsmoking adults c) Smoking adults Measured as carboxyhemoglobin and converted to mL/100ml blood. Heel or fingerstick as reliable as venipuncture for drawing blood. Infants, smoking and nonsmoking adults. California.

BLOOD; CALIFORNIA; PREMATURE INFANTS; DELIBERATE EXPOSURE; ENVIRONMENTAL EXPOSURE; ADULTS; MEASUREMENT METHODS; COMPARATIVE EVALUATIONS; CARBON MONOXIDE; SMOKING
Vreman, H.J.; Kwong, L.K.; Stevenson, D.K. 1984 Clinical Chemistry 30(8):1382-1386

Carbon monoxide
630-08-0
C-O
MW 28.01, MP -205 C, BP -191.5 C, VP 10 mm Hg at -215 C, 100 mm Hg at -205.7 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9065 Blood, plasma	a) 24 b) 23 c) 20 Inhalation	a) Not given b) Not given c) Not given	a) 40+/-13 ppm b) 40+/-19 ppm c) 44+/-18 ppm	a) 5 min after smoking <0.5 mg (mean 0.30+/-0.28 mg) nicotine/cigarette b) 0.5-1.0 (mean 0.76+/-0.15) mg nicotine/cigarette c) >1.0 (mean 1.20+/-0.19) mg nicotine/cigarette Mean 30-34 cigarettes/d. Nicotine/cigarette measured by smoking machine. Stop-smoking program participants and V.A. Medical Center employees and patients, Little Rock, AR. Average age 45+/-11 yr Breath analyzer
BLOOD PLASMA; DELIBERATE EXPOSURE; ADULTS; DRUGS; COMPARATIVE EVALUATIONS; CARBON MONOXIDE; NICOTINE; SMOKING; INHALATION Ebert, R.V.; McNabb, M.E.; McCusker, K.T.; Snow, S.L. 1983 Journal of the American Medical Association 250(20):2840-2842				

Tissue	Cases Exposure Route	Range	Mean	General Information
9066 Breath	a) 12 b) 17 Inhalation	a) 4.6+/-0.466-4.7+/-0.35 ppm b) 5.8+/-0.52-6.0+/-0.849 ppm c) 12.9+/-0.716-13.1+/-0.928 ppm d) 14.0+/-0.792-15.9+/-0.769 ppm	a) Not given b) Not given c) Not given d) Not given	a) Nonsmokers, before cooking/dishwashing b) After cooking/dishwashing c) Smokers, before cooking/dishwashing d) After cooking/dishwashing Ranges of geometric means, measured on 2 successive days. >250 ppm in flue gases produced by water heaters. Carboxyhemoglobin levels, calculated from breath levels, remained in safe range (<2.5%) in a) and b). Most smokers had levels >2.5% in c) as well as d). 12-72 yr old residents of 15 flats equipped with instantaneous gas-fired water heaters, Netherlands. GLC
BREATH; ENVIRONMENTAL EXPOSURE; NETHERLANDS; CARBON MONOXIDE; HEALTH HAZARDS; INHALATION; SMOKING Verhoeff, A.P.; van der Velde, H.C.M.; Boleij, J.S.M.; Lebret, E.; Brunekreef, B. 1983 International Archives of Occupational and Environmental Health 53:167-173				

Tissue	Cases Exposure Route	Range	Mean	General Information
9067 Breath	11 Inhalation	a) Not given b) Not given c) Not given d) Not given	a) 19.2 +or- 9.7 ppm b) 23.6 +or- 9.4 ppm c) 22.6 +or- 7.1 ppm d) 26.8 +or- 5.8 ppm	a) Before 1st cigarette following overnight abstinence from smoking b) After cigarette c) Before 2nd cigarette, 6-36 min after 1st cigarette d) After cigarette Smokers of 40 or more cigarettes/day, wt 73.6 +or- 11.2 kg
BLOOD; BREATH; DRUGS; CARBON MONOXIDE; NICOTINE; INHALATION; SMOKING; DELIBERATE EXPOSURE Herning, R.I.; Jones, R.T.; Benowitz, N.L.; Mines, A.H. 1983 Clinical Pharmacology and Therapeutics 33(1):84-90				

Carbon monoxide
630-08-0
C-O
MW 28.01, MP -205 C, BP -191.5 C, VP 10 mm Hg at -215 C, 100 mm Hg at -205.7 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9068 Breath	96	31.6+/-11.3-40.7+/-14 ppm	35 ppm	Smokers at end of 1 yr of decrased nicotine intake. Not different from baseline values found in previous study (31.0+/-12.1-34.2+/-10.5 ppm) 38-40 yr olds, smokers, NYC, NY
BREATH; DELIBERATE EXPOSURE; NEW YORK; CARBON MONOXIDE; NICOTINE; INHALATION; SMOKING; TOBACCOS Kansler, M.; Jaffe, J.H.; Nee J. 1983 Clinical Pharmacology and Therapeutics 34:408-415				

Carbon tetrachloride (8 CI); Methane, tetrachloro- (9 CI)
56-23-5
C-Cl4
MW 153.84, MP -22.6 C, BP 76.8 C, VP 100 mm Hg at 23.0 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9069 Breath	a) 9 b) 3	a) 0.10-46.50 ug/cu m b) 0.10-0.30 ug/cu m	a) 0.3 ug/cu m (median) b) Not given	a) Bayonne and Elizabeth, NJ. 4 chemical and oil workers, 4 persons with no occupational exposure, 1 sewage plant operator (registered highest levels of all) b) Research Triangle Park, NC subjects with no occupational exposure. Food an unimportant exposure route. Adult volunteers GC-MS
BREATH; ENVIRONMENTAL EXPOSURE; OCCUPATIONAL EXPOSURE; NEW JERSEY; NORTH CAROLINA; CHLORINATED HYDROCARBONS; CHLORINE ORGANIC COMPOUNDS; VOLATILE ORGANIC COMPOUNDS; BIOLOGICAL MONITORING; DRINKING WATER; FOODS Wallace, L.A.; Pellizzari, E.; Hartwell, T.; Rosenzweig, M.; Erickson, M.; Sparacino, C.; Zelon, H. 1984 Environmental Research 35:293-319				

Carbonylhemoglobin
9061-29-4
EXACT COMPOSITION UNKNOWN OR UNDETERMINED

Tissue	Cases Exposure Route	Range	Mean	General Information
9070 Blood, plasma	6 Inhalation	0.6+/-0.1%-1.3+/-0.1%	Not applicable	Percent of hemoglobin, 0-136 min, peak (1.9+/-0.1%) at 10-25 min. Correlated well with partial pressure of exhaled carbon monoxide. Healthy volunteers, 25-27 yr old, 3 males, 3 females, moderate (20-30 cigarettes daily) smokers GC
BLOOD PLASMA; URINE; DELIBERATE EXPOSURE; UNITED KINGDOM; ADULTS; STIMULANTS; HEMOGLOBINS; NICOTINE; THIOCYANATES; BIOACCUMULATION; BIOINDICATORS; HEALTH HAZARDS; INHALATION; METABOLISM; SMOKING; TOBACCOS; SALIVA; DRUGS Hopkins, R.; Wood, L.E.; Sinclair, N.M. 1984 Clinical Pharmacology and Therapeutics 36(6):788-795				

Carbonylhemoglobin
9061-29-4
EXACT COMPOSITION UNKNOWN OR UNDETERMINED

Tissue	Cases Exposure Route	Range	Mean	General Information
9071 Blood, whole	a) 167 b) 181 Inhalation	a) 0.5-12.0% b) 0.0-2.5%	a) 4.36+/-2.09% b) 0.93+/-0.52%	a) Smokers, 22.8+/-12.5 cigarettes/d b) Non-smokers Order of sensitivity in distinguishing groups: plasma, cotinine, blood carboxyhemoglobin, thiocyanate 167 in voluntary smoking-reduction campaign. 181 non-smokers matched for age and sex. CO-oximeter
BLOOD PLASMA; DELIBERATE EXPOSURE; AUSTRALIA; ADULTS; COMPARATIVE EVALUATIONS; HEMOGLOBINS; THIOCYANATES; NICOTINE; BIOACCUMULATION; BIOLOGICAL MONITORING; HEALTH HAZARDS; INHALATION; METABOLITES; SMOKING; TOBACCOS Pojer, R.; Whitfield, J.B.; Poulse, V.; Eckhart, I.F.; Richmond, R.; Hensley, W.J. 1984 Clinical Chemistry 30(8):1377-1380				

Cerium
7440-45-1
Ce
AtW 140.12, MP 795 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9072 Lung	a) 1 b) 11 Inhalation	a) Not given b) Not given	a) 166,500 ppb b) 70.6 ppb	a) Exposed worker, biopsy b) Unexposed controls, autopsies 58 yr old photoengraver, exposed to smoke from carbon arc lamp during 46 yr. 20-83 yr old controls. Italy Worker: dyspnea, cough, cyanosis (extremities), crepitant rales, pulmonary fibrosis, hypertension, cardiac hypertrophy and overloading, death from acute cardiorespiratory insufficiency NA
9073 Lymph node	a) 1 b) 6 Inhalation	a) Not given b) Not given	a) 4,905 ppb b) 93 ppb	a) Exposed worker, biopsy b) Unexposed controls, autopsies 58 yr old photoengraver, exposed to smoke from carbon arc lamp during 46 yr. 20-83 yr old controls. Italy Worker: dyspnea, cough, cyanosis (extremities), crepitant rales, pulmonary fibrosis, hypertension, cardiac hypertrophy and overloading, death from acute cardiorespiratory insufficiency NA
NEODYMIUM; YTTERBIUM; TERBIUM; EUROPIUM; LUTETIUM; ITALY; ADULTS; AUTOPSIES; CASE HISTORIES; PNEUMOCONIOSIS; LUNGS; LYMPH NODES; BIOPSIES; CERIUM; LANTHANUM; METALS; SAMARIUM; THORIUM; DUST; FUMES; INHALATION; OCCUPATIONAL HAZARDS; PRINTING INDUSTRY; OCCUPATIONAL EXPOSURE Vecature, G.; Colombo, P.; Zanoni, M.; Rodi, F.; Sabbioni, E.; Pietra, R. 1983 Chest 83(5):780-783				

Ceslum

7440-46-2
Cs
AtW 132.9054, MP 28.5 C, BP 705 C, VP 1 mm Hg at 279 C, 10 mm Hg at 373 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9074 Blood, plasma		a) Not given b) Not given c) Not given	a) 0.0026+/-0.0008 ug/mL b) 0.0039+/-0.0016 ug/mL c) 0.0030+/-0.0006 ug/mL	a) Insulin-treated diabetics b) Non-insulin-treated diabetics c) Control non-diabetics Collected after overnight fasting. Significant differences among all groups. 18-78 yr olds, Oxford, England NA; AAS
BLOOD PLASMA; ENGLAND; DIABETES; METABOLISM; MINERAL METABOLISM; ALUMINUM; ANTIMONY; ARSENIC; BARIUM; BROMINE; CADMIUM; CALCIUM; CESIUM; CHROMIUM; COBALT; COPPER; IODINE; IRON; LEAD; MAGNESIUM; MANGANESE; MERCURY; MOLYBDENUM; NICKEL; RUBIDIUM; SCANDIUM; SELENIUM; SILVER; TIN; VANADIUM; ZINC Ward, N.I.; Pim, B. 1984 Biological Trace Element Research 6:469-487				

Chlordane

12789-03-6
C10-H6-Cl8
MW 409.8, BP 175 C at 2 mm Hg, VP 1X10(E-5) mm Hg at 25 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9075 Adipose	105 Ingestion	a) Not given b) Not given c) Not given d) Not given e) Not given f) Not given g) Not given h) Not given i) Not given j) Not given	a) 7.41+/-4.40 ug/kg b) 6.07+/-4.35 ug/kg c) 9.45+/-3.35 ug/kg d) 6.25+/-2.88 ug/kg e) 1.90+/-0.00 ug/kg f) 2.28+/-1.12 ug/kg g) 6.83+/-4.27 ug/kg h) 3.74+/-2.43 ug/kg i) 6.27+/-4.90 ug/kg j) 7.42+/-5.30 ug/kg	a) Men, whole country b) Women, whole country c) Men, South Finland d) Women, South Finland e) Men, <=1 fish meal/mo f) Women <=1 fish meal/mo g) Men, 2-3 fish meals/mo h) Women, 2-3 fish meals/mo i) Men, >=4 fish meals/mo j) Women, >=4 fish meals/mo. Hospital patients and accidental fatalities, 2 mo-91 yr old GC/MS
ADIPOSE TISSUE; ENVIRONMENTAL EXPOSURE; FINLAND; SEX; AGE; AUTOPSIES; BIOPSIES; CHLORINATED HYDROCARBONS; HEPTACHLOR EPOXIDE; HEXACHLOROBENZENE; DOT; POLYCHLORINATED BIPHENYLS; BIOACCUMULATION; BIOLOGICAL MONITORING; DIETS; FISHES; FOOD CONTAMINATION; HEALTH HAZARDS; POPULATION EXPOSURE Mussalo-Rauhamaa, H.; Pyysalo, H.; Moilanen, R. 1984 Journal of Toxicology and Environmental Health 13:689-704				

Tissue	Cases Exposure Route	Range	Mean	General Information
9076 Adipose	1 Ingestion	Not given	22.00 ug/g	Autopsy. Fatal intoxication after unknown quantity of fluid containing 69.8% chlordane. 59 yr old, ht 68 in., wt 115 lb, OH No gross anatomical or histological abnormalities GC-EC

(next page)

Chlordane
12789-03-6
C10-H6-Cl8
MW 409.8, BP 175 C at 2 mm Hg, VP 1X10(E-5) mm Hg at 25 C

(continued)

Tissue	Cases Exposure Route	Range	Mean	General Information
9077 Blood, plasma	1 Ingestion	Not given	4.87 ug/g	Autopsy. Fatal intoxication after unknown quantity of fluid containing 69.8% chlordane. 59 yr old, ht 68 in., wt 115 lb, OH GC-EC
9078 Brain	1 Ingestion	Not given	23.27 ug/g	Autopsy. Fatal intoxication after unknown quantity of fluid containing 69.8% chlordane. 59 yr old, ht 68 in., wt 115 lb, OH GC-EC
9079 Kidney	1 Ingestion	Not given	14.10 ug/g	Autopsy. Fatal intoxication after unknown quantity of fluid containing 69.8% chlordane. 59 yr old, ht 68 in., wt 115 lb, OH GC-EC
9080 Liver	1 Ingestion	Not given	59.93 ug/g	Autopsy. Fatal intoxication after unknown quantity of fluid containing 69.8% chlordane. 59 yr old, ht 68 in., wt 115 lb, OH GC-EC
OHIO; AUTOPSIES; CASE HISTORIES; ADIPOSE TISSUE; BLOOD PLASMA; BRAIN; KIDNEYS; LIVER; SPLEEN; URINE; FORENSIC MEDICINE; CHLORINE ORGANIC COMPOUNDS; INSECTICIDES; ACCIDENTAL POISONING; PESTICIDE RESIDUES; DELIBERATE EXPOSURE Kutz, F.W.; Strassman, S.C.; Sperling, J.F.; Cook, B.T.; Sunshine, I.; Tessari, J. 1983 Journal of Toxicology - Clinical Toxicology 20(2):167-174				

Tissue	Cases Exposure Route	Range	Mean	General Information
9081 Milk	a) 54 b) 102	a) None detected b) None detected	a) None detected b) None detected	a) Hawaii b) Mainland USA Sampled up to 1 mo postpartum. Lipid basis. 1979-80 GC
HAWAII; UNITED STATES; ADULTS; MILK; ALDRIN; CHLORINATED HYDROCARBONS; CHLORINE ORGANIC COMPOUNDS; DDD; DDE; DDT; DIELDRIN; HEPTACHLOR EPOXIDE; HEPTACHLOROCYCLOHEXANE; HEXACHLOROBENZENE; LINDANE; NONACHLOR; OXYCHLORDANE; POLYCHLORINATED BIPHENYLS; PESTICIDE RESIDUES; POPULATION EXPOSURE; ENVIRONMENTAL EXPOSURE Takei, G.H.; Kauahikaua, S.M.; Leong, G.H. 1983 Bulletin of Environmental Contamination and Toxicology 30:606-613				

Tissue	Cases Exposure Route	Range	Mean	General Information
9082 Spleen	1 Ingestion	Not given	19.15 ug/g	Autopsy. Fatal intoxication after unknown quantity of fluid containing 69.8% chlordane. 59 yr old, ht 68 in., wt 115 lb, OH GC-EC

(next page)

Chlordane

12789-03-6
C10-H6-Cl8
MW 409.8, BP 175 C at 2 mm Hg, VP 1X10(E-5) mm Hg at 25 C

(continued)

Tissue	Cases Exposure Route	Range	Mean	General Information
9063 Urine	1 Ingestion	Not given	0.20 ug/g	Autopsy. Fatal intoxication after unknown quantity of fluid containing 69.8% chlordane. 59 yr old, ht 68 in., wt 115 lb, OH GC-EC
OHIO; AUTOPSIES; CASE HISTORIES; ADIPOSE TISSUE; BLOOD PLASMA; BRAIN; KIDNEYS; LIVER; SPLEEN; URINE; FORENSIC MEDICINE; CHLORINE ORGANIC COMPOUNDS; INSECTICIDES; ACCIDENTAL POISONING; PESTICIDE RESIDUES; DELIBERATE EXPOSURE Kuts, F.W.; Strassman, S.C.; Sperling, J.F.; Cook, B.T.; Sunshine, I.; Tessari, J. 1983 Journal of Toxicology - Clinical Toxicology 20(2):167-174				

Chloride

16887-00-6
Cl
AtW 35.45

Tissue	Cases Exposure Route	Range	Mean	General Information
9064 Blood, plasma	14 Ingestion	a) Not given b) Not given c) Not given d) Not given e) Not given f) Not given g) Not given h) Not given	a) 109+/-3 mmol b) 106+/-2 mmol c) 103+/-2 mmol d) 99+/-5 mmol e) 105+/-2 mmol f) 106+/-1 mmol g) 102+/-3 mmol h) 103+/-1 mmol S.E.	a) Infants fed mothers' milk, start of study, 7 cases b) At 1 wk, 7 cases c) At 2 wk, 7 cases d) At 4 wk, 5 cases e) Infants fed formula, start of study, 6 cases f) At 1 wk, 6 cases g) At 2 wk, 6 cases h) At 4 wk (+ supplements NaHCO3, Ca-lactate), 5 cases Levels similar between groups during period of study. Premature infants, birth wt <1.3 kg, mean gestational age 28 wk, Canada Chem; Electrochem
9065 Milk	7	a) Not given b) Not given c) Not given	a) 16.0+/-2.20 mmol b) 14.0+/-1.10 mmol c) 12.8+/-1.10 mmol S.E.	a) 6-8 days postpartum b) 13-15 days postpartum c) 26-28 days postpartum Mothers of premature infants. Infant birth wt <1.3 kg, mean gestational age 28 wk, Canada Chem; Electrochem
PREMATURE INFANTS; CANADA; NUTRITIONAL DEFICIENCIES; BLOOD PLASMA; MILK; COMPARATIVE EVALUATIONS; CALCIUM; MAGNESIUM; MINERALS; PHOSPHORUS; POTASSIUM; SODIUM; FOODS; LACTATION; DELIBERATE EXPOSURE Atkinson, S.A.; Radde, I.C.; Anderson, G.H. 1983 Journal of Pediatrics 102(1):99-106				

Chlorine

7782-50-5
Cl
AtW 35.753, MP -101 C, BP -34.05 C, VP 4800 mm Hg at 20 C, 1 mm Hg at -123 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9086 Hair	6	a) 0-2900 ug/g b) 0-1600 ug/g c) 800-1400 ug/g d) 2100-2600 ug/g e) 700-1800 ug/g f) 0-1000 ug/g Estimated from figure	a) 1400 ug/g b) 760 ug/g c) 1100 ug/g d) 2300 ug/g e) 1200 ug/g f) 760 ug/g	a) 0-40 cm from scalp, 7 yr old female b) 0-40 cm from scalp, 4 yr old female c) 0-30 cm from scalp, 7 yr old female d) 0-18 cm from scalp, 3 yr old female e) 0-15 cm from scalp, 2 yr old male f) 0-65 cm from scalp, 40 yr old female Range from total length, mean from 1st 10 cm from scalp. Levels decreased with increasing distance from scalp. Japan NA

HAIR; ENVIRONMENTAL EXPOSURE; JAPAN; ADULTS; CHILDREN; COMPARATIVE EVALUATIONS; BROMINE; CALCIUM; CHLORINE; COPPER; IODINE; MAGNESIUM; MANGANESE; MERCURY; SELENIUM; ZINC; BIOINDICATORS

Yukawa, M.; Suzuki-Yasumoto, M.; Tanaka, S. 1984 Science of the Total Environment 38:41-54

Chloroform (8 Cl); Methane, trichloro- (9 Cl)

67-66-3
C-H-Cl3
MW 119.39, MP -63.5 C, VP 100 mm Hg at 10.4 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9067 Breath	a) 9 b) 8	a) 0.09-53.0 ug/cu m b) 0.11-665.0 ug/cu m	a) 3.5 ug/cu m (median) 6.2, 3.7, 0.4 ug/cu m b) 50.0 ug/cu m (median) >30.0 ug/cu m	a) Bayonne and Elizabeth, NJ. Jul, Sept, Dec 1980 geometric means. 4 chemical and oil workers, 4 persons with no occupational exposure, 1 sewage plant operator (registered highest levels of all) b) Research Triangle Park, NC, geometric mean. Subjects with no occupational exposure Of 8 most prevalent chemicals (total of 12), was lowest in NJ, highest in NC. Beverages and water appeared important as exposure routes, food relatively unimportant. Adult volunteers GC-MS

BREATH; ENVIRONMENTAL EXPOSURE; OCCUPATIONAL EXPOSURE; NEW JERSEY; NORTH CAROLINA; CHLORINATED HYDROCARBONS; CHLORINE ORGANIC COMPOUNDS; VOLATILE ORGANIC COMPOUNDS; BIOLOGICAL MONITORING; DRINKING WATER; FOODS

Wallace, L.A.; Pellizzari, E.; Hartwell, T.; Rosenzweig, M.; Erickson, M.; Sparacino, C.; Zelon, H. 1984 Environmental Research 35:293-319

Cholesterol (8 CI); Cholest-5-en-3-ol (3beta)- (9 CI)

57-88-5
C27-H46-O
MW 386.64, MP 148.5 C (anhydrous), BP 233 C at 0.5 mm Hg, 360 C at 760 mm Hg (some decomp)

Tissue	Cases Exposure Route	Range	Mean	General Information
9088 Blood, serum	a) 50 b) 158	a) Not given b) 2073+/-73-2511+/-103 mg/L S.E.	a) 1584+/-44 mg/L b) Not given S.E.	a) Controls b) Patients with ischemic heart disease and hypertension Range of means. Controls from group of 30-56 yr olds (42 males, 8 females), 24% with family history of ischemic heart disease. 30-80 yr old patients (138 males, 21 females), 62% smokers, 27% with similar family history Colorimetry
BLOOD SERUM; HEART DISEASES; HYPERTENSION; TRACE ELEMENTS; COPPER; ZINC; IRON; NICKEL; COBALT; SODIUM; POTASSIUM; CALCIUM; MAGNESIUM; PAKISTAN; COMPARATIVE EVALUATIONS; CHOLESTEROLS Khan, S.N.; Rahman, M.A.; Samad, A. 1984 Clinical Chemistry 30(5):644-648				

Tissue	Cases Exposure Route	Range	Mean	General Information
9089 Blood, serum	24 Ingestion	Not given	175+/-4 mg/dl S.E.	11% decrease ($p<0.01$) 24 hr after 6 g dose of orotic acid. Level still within normal limits. Healthy 22-62 yr old, all university students and employees. HPLC
BLOOD SERUM; URINE; DELIBERATE EXPOSURE; ILLINOIS; ADULTS; COMPARATIVE EVALUATIONS; CHOLESTEROLS; PHOSPHORUS; METABOLITES Robinson, J.L.; Dombrowski, D.B. 1983 Nutrition Research 3:407-415				

Chromium

7440-47-3
Cr
AtW 51.996, MP 1900 C, BP 2642 C, VP 1 mm Hg at 1616 C, 10 mm Hg at 1840 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9090 Aorta	a) 3 b) 6 c) 7	a) Not applicable b) 0.0-1.0 ppm c) Not given Dry wt	a) 0 ppm b) Not given c) 3.2+/-2.8 ppm Dry wt	a) Sclerotic aorta from metal-workers b) Normal aorta from metal-workers c) Normal aorta from non metal-workers 45-66 yr old workers. Autopsies, Japan, 1976-1977. Employed 7-32 yr ES
AORTA; VERTEBRAE; BONES; ENVIRONMENTAL EXPOSURE; OCCUPATIONAL EXPOSURE; JAPAN; AUTOPSIES; CADAVERS; CARDIOVASCULAR DISEASES; MINERALS; BIOACCUMULATION; DIETS; FOODS; MINERAL DEPOSITS; CALCIUM; PHOSPHORUS; IRON; MAGNESIUM; ZINC; ALUMINUM; COPPER; CADMIUM; LEAD; NICKEL; VANADIUM; CHROMIUM; MANGANESE; SILICON; TIN; TITANIUM; STRONTIUM Terasoka, H. 1984 Archives of Environmental Contamination and Toxicology 13:119-127				

Chromium
7440-47-3
Cr
AtW 51.996, MP 1900 C, BP 2642 C, VP 1 mm Hg at 1616 C, 10 mm Hg at 1840 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9091 Blood	a) 1 b) 1	a) 0.16-0.21 umol/l b) 0.09-0.13 umol/l	a) Not given b) Not given	a) Operator of hide press, Mon, Fri levels b) Another operator of hide press, Mon, Fri levels Daily levels varied widely with tendency toward diurnal variation. Workers in leather tannery AAS
9092 Blood, plasma	a) 1 b) 1	a) 0.34-42 umol/l b) 0.20-25 umol/l	a) Not given b) Not given	a) Operator of hide press, Mon, Fri levels b) Another operator of hide press, Mon, Fri levels Daily levels varied widely with tendency toward diurnal variation. Workers in leather tannery AAS

CHROMIUM; URINE; OCCUPATIONAL EXPOSURE; FINLAND; DIURNAL VARIATIONS
Aitio, A.; Jarvisalo, J.; Kiilunen, M.; Toesavainen, A.; Vaittinen 1984 International Archives of Occupational and Environmental Health 54:241-249

Tissue	Cases Exposure Route	Range	Mean	General Information
9093 Blood, plasma	13 Inhalation	a) <0.02-0.82 umol/l b) Not given c) Not given d) Not given	a) 0.19 umol/l b) <0.02 umol/l c) 0.18 umol/l d) 0.20 umol/l	a) Welders, 10 cases, daily mean b) Controls, 3 cases c) Welders, before shift d) Welders, after shift Concentration of Cr and Ni in air correlated with urine levels and with retention of magnetic dust in lungs. Healthy stainless steel welders, 39+/-6 yr. Employed 13+/-6 yr. Controls in same factory but not exposed to fumes. AAS

BLOOD PLASMA; BLOOD; URINE; OCCUPATIONAL EXPOSURE; ADULTS; CHROMIUM; NICKEL; METALS; BIOLOGICAL MONITORING; INDUSTRIAL ATMOSPHERES; INHALATION
Rahkonen, E.; Junttila, M.-L.; Kalliomaki, L.; Olkinuora, M.; Koponen, M.; Kalliomaki, K. 1983 International Archives of Occupational and Environmental Health 52:245-255

Tissue	Cases Exposure Route	Range	Mean	General Information
9094 Blood, plasma	a) 67 b) 10 c) 28	a) <0.3-6 ng/mL b) 0.3->6 ng/mL c) 4->10 ng/mL	a) 1.05+/-0.11 ng/mL b) 1.72+/-0.30 ng/mL c) 6.51+/-0.47 ng/mL Weighted means	a) Coronary artery disease b) Heart disease c) Normal-no heart disease Normals (c) all had >4 ng/mL, 87% in a) had less than 4 ng/mL. Subjects referred for selective coronary artery cineangiography to distinguish those with true coronary artery disease PIXE

CHROMIUM; BLOOD PLASMA; HEART DISEASES; CARDIOVASCULAR DISEASES
Simonoff, M.; Llabador, Y.; Hamon, C.; Peers, A.M.; Simonoff, G.N. 1984 Biological Trace Element Research 6(5):431-439

Chromium

7440-47-3

Cr

AtW 51.996, MP 1900 C, BP 2642 C, VP 1 mm Hg at 1616 C, 10 mm Hg at 1840 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9085 Blood, plasma		a) Not given b) Not given c) Not given	a) 0.0068+/-0.0007 ug/mL b) 0.0069+/-0.0020 ug/mL c) 0.0061+/-0.0010 ug/mL	a) Insulin-treated diabetics b) Non-insulin-treated diabetics c) Control non-diabetics Collected after overnight fasting. Significant differences between a), c) and b), c). 16-78 yr olds, Oxford, England NA; AAS

BLOOD PLASMA; ENGLAND; DIABETES; METABOLISM; MINERAL METABOLISM; ALUMINUM; ANTIMONY; ARSENIC; BARIUM; BROMINE; CADMIUM; CALCIUM; CESIUM; CHROMIUM; COBALT; COPPER; IODINE; IRON; LEAD; MAGNESIUM; MANGANESE; MERCURY; MOLYBDENUM; NICKEL; RUBIDIUM; SCANDIUM; SELENIUM; SILVER; TIN; VANADIUM; ZINC

Ward, N.I.; Pim, B. 1984 Biological Trace Element Research 6:469-487

Tissue	Cases Exposure Route	Range	Mean	General Information
9086 Blood, serum	9	a) Not given b) Not given c) Not given	a) 0.12+/-0.02 ng/ml b) 0.17+/-0.03 ng/ml c) 0.19+/-0.03 ng/ml	a) Immediately before 6 mi run b) Immediately after run c) 2 hr after run Significant differences a), b) and a), c) ($p<0.05$). Fasted from 10 hr before to 2 hr after run. Also measured cholesterol, triglycerides, bilirubin, albumin, protein, uric acid, urea, phosphate, and alkaline phosphatase. 23-46 yr old male runners AAS

BLOOD SERUM; URINE; CALCIUM; CHROMIUM; COPPER; POTASSIUM; SODIUM; ZINC; TRACE ELEMENTS; ADULTS

Anderson, R.A.; Polansky, M.M.; Bryden, N.A. 1984 Biological Trace Element Research 6:327-336

Tissue	Cases Exposure Route	Range	Mean	General Information
9087 Blood, whole	13 Inhalation	a) <0.05-1.35 umol/l b) Not given c) 0.05-1.43 umol/l d) Not given	a) 0.24 umol/l b) <0.05 umol/l c) 0.23 umol/l d) 0.25 umol/l	a) Welders, 10 cases, daily mean b) Controls, 5 cases c) Welders, before shift d) Welders, after shift Concentration of Cr and Ni in air correlated with urine levels and with retention of magnetic dust in lungs. Healthy stainless steel welders, 30+/-6 yr. Employed 13+/-6 yr. Controls in same factory but not exposed to fumes. AAS

BLOOD PLASMA; BLOOD; URINE; OCCUPATIONAL EXPOSURE; ADULTS; CHROMIUM; NICKEL; METALS; BIOLOGICAL MONITORING; INDUSTRIAL ATMOSPHERES; INHALATION

Rahkonen, E.; Junttila, M.-L.; Kalliomaki, L.; Olkinuora, M.; Koponen, M.; Kalliomaki, K. 1982 International Archives of Occupational and Environmental Health 52:245-255

Chromium

7440-47-3

Cr

AtW 51.996, MP 1900 C, BP 2642 C, VP 1 mm Hg at 1616 C, 10 mm Hg at 1840 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9066 Breast	22	a) Not given b) Not given	a) 1.20+/-0.65 ug/g b) 1.48+/-0.80 ug/g	a) Normal tissue b) Neoplastic Dry wt, 8 samples, p=0.16 Patients with primary breast carcinomas, samples of normal and neoplastic tissue obtained at time of mastectomy X-ray fluorescence
BREAST; CALCIUM; VANADIUM; CHROMIUM; MANGANESE; IRON; NICKEL; COPPER; ZINC; ARSENIC; SELENIUM; BROMINE; RUBIDIUM; STRONTIUM; MOLYBDENUM; LEAD; MERCURY; NEOPLASMS Rizk, S.L.; Sky-Peck, H.H. 1984 Cancer Research 44:5390-5394				

Tissue	Cases Exposure Route	Range	Mean	General Information
9089 Kidney	29	a) Not given b) Not given c) Not given d) Not given e) Not given	a) 12 ug/kg b) 5 ug/kg c) 9 ug/kg d) 9 ug/kg e) 3 ug/kg Medians, wet wt	a) Smelter workers, 10 with malignancies (35% of deaths): mean exposure 31.2 yr, mean length of retirement 8 yr b) 8 with cardiovascular disease (45% of deaths): mean exposure 31.4 yr, mean retirement 5.6 yr c) 3 with other diseases: mean exposure 26.7 yr, mean retirement 10.3 yr d) All 21 workers: mean exposure 30.4 yr, mean retirement 7.4 yr e) 8 controls. No malignancies, cardiovascular disease in 80% of deaths All autopsies, post-1975. No significant differences between smokers, ex-smokers and non-smokers. Copper smelter workers, northern Sweden, mean age 67.8 yr. Controls, rural residents, 50 km from smelter, mean age 67.9 yr NA
9100 Liver	26	a) Not given b) Not given c) Not given d) Not given e) Not given	a) 11 ug/kg b) 14 ug/kg c) 58 ug/kg d) 11 ug/kg e) 4 ug/kg Medians, wet wt	a) Smelter workers, 10 with malignancies (35% of deaths): mean exposure 31.2 yr, mean length of retirement 8 yr b) 8 with cardiovascular disease (45% of deaths): mean exposure 31.4 yr, mean retirement 5.6 yr c) 2 with other diseases: mean exposure 26.7 yr, mean retirement 10.3 yr d) All 20 workers: mean exposure 30.4 yr, mean retirement 7.4 yr e) 8 controls. No malignancies, cardiovascular disease in 80% of deaths All autopsies, post-1975. No significant differences between smokers, ex-smokers and non-smokers. Copper smelter workers, northern Sweden, mean age 67.8 yr. Controls, rural residents, 50 km from smelter, mean age 67.9 yr NA
KIDNEYS; LIVER; LUNGS; OCCUPATIONAL EXPOSURE; ENVIRONMENTAL EXPOSURE; SWEDEN; AUTOPSIES; CARCINOMAS; CARDIOVASCULAR DISEASES; NEOPLASMS; CHROMIUM; COBALT; LANTHANUM; SMELTERS Gerhardsson, L.; Wester, P.O.; Nordberg, G.F.; Brune, D. 1986 Science of the Total Environment 57:233-246				

Chromium
7440-47-3
Cr
AtW 51.996, MP 1900 C, BP 2642 C, VP 1 mm Hg at 1616 C, 10 mm Hg at 1840 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9101 Liver	96	a) <0.01-0.30 mg/kg b) <0.01-0.26 mg/kg	a) 0.06 +or- 0.09 mg/kg b) 0.04 +or- 0.04 mg/kg	a) Females b) Males Autopsies. Levels generally lower than those in other countries. No major regional variations. New Zealanders. Death by physical injuries AAS

LIVER; COMPARATIVE EVALUATIONS; ARSENIC; CADMIUM; CHROMIUM; COBALT; COPPER; NEW ZEALAND; AUTOPSIES; LEAD; MANGANESE; MERCURY; NICKEL; SELENIUM; SILVER; ZINC
Pickston, L.; Lewin, J.F.; Drysdale, J.M.; Smith, J.M.; Bruce, J. 1983 Journal of Analytical Toxicology 7:2-6

Tissue	Cases Exposure T	Range	Mean	General Information
9102 Lung	70	a) Not given b) Not given c) Not given d) Not given e) Not given	a) 400 ug/kg b) 410 ug/kg c) 470 ug/kg d) 420 ug/kg e) 96 ug/kg Medians, wet wt	a) Smelter workers, 24 with malignancies (33% of deaths): mean exposure 31.2 yr, mean length of retirement 8 yr b) 20 with cardiovascular disease (45% of deaths): mean exposure 31.4 yr, mean retirement 5.6 yr c) 12 with other diseases: mean exposure 26.7 yr, mean retirement 10.3 yr d) All 65 workers: mean exposure 30.4 yr, mean retirement 7.4 yr 14 controls e) No malignancies, cardiovascular disease in 80% of deaths All autopsies, post-1975. No significant differences between smokers, ex-smokers and non-smokers. Copper smelter workers, northern Sweden, mean age 67.8 yr. Controls, rural residents, 50 km from smelter, mean age 67.9 yr NA

KIDNEYS; LIVER; LUNGS; OCCUPATIONAL EXPOSURE; ENVIRONMENTAL EXPOSURE; SWEDEN; AUTOPSIES; CARCINOMAS; CARDIOVASCULAR DISEASES; NEOPLASMS; CHROMIUM; COBALT; LANTHANUM; SMELTERS
Gerhardsson, L.; Wester, P.O.; Nordberg, G.F.; Brune, D. 1984 Science of the Total Environment 37:233-246

Tissue	Cases Exposure Route	Range	Mean	General Information
9103 Milk				Review. Chemicals found in occupational exposures are discussed in terms of milk partition factors, potential infant exposures and possible infant health effects.

LEAD; MERCURY; PESTICIDES; POLYCHLORINATED BIPHENYLS; OCCUPATIONAL HAZARDS; MILK; COMPARATIVE EVALUATIONS; REVIEW; CADMIUM; CHROMIUM; DDT; DIELDRIN; INFANTS
Wolff, M.S. 1983 American Journal of Industrial Medicine 4:259-281

Chromium

7440-47-3

Cr

AtW 51.996, MP 1900 C, BP 2642 C, VP 1 mm Hg at 1616 C, 10 mm Hg at 1840 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9104 Urine	28	a) 2-62 umol, 0.9-29 ug b) 8-155 umol, 1.5-71 ug c) <0.6-7 umol, <0.3-3 ug /mol, /g creatinine	a) 12 umol, 6 ug b) 23 umol, 11 ug c) 1.5 umol, 0.7 ug /mol, /g creatinine Medians	a) Stainless steel metal arc welders, Monday a.m. b) Same workers, Monday afternoon c) 17 matched controls Welders, mean age 45 yr (range 34-64), from 6 industries. Long, intense welding for mean of 20 yr (range 7-41 yr) AAS

URINE; CHROMIUM; OCCUPATIONAL EXPOSURE; SWEDEN; INDUSTRIAL ATMOSPHERES; INDUSTRIES

Littorin, M.; Welinder, H.; Hultberg, B. 1984 International Archives of Occupational and Environmental Health 53:279-282

Tissue	Cases Exposure Route	Range	Mean	General Information
9106 Urine	7 Injection	a) 2.8-22.0 ng/ml b) Not given c) Not given d) Not given	a) 10.3+/-2.8 ng/mL b) 2.0+/-0.6 ng/mL c) 1.9+/-0.5 ng/mL d) 1.7+/-0.53 ppb S.E.	a) 4 hr b) 42 hr c) 72 hr d) 72-168 hr, 5 patients Times after admission. Significant decrease, a), b) ($p<0.05$). Cr intake from IV's and parenteral nutrition solution varied. Data also given for serum glucose, urinary creatinine and ng Cr/mg creatinine. Severly traumatized 15-57 yr olds, mean age 26.7, Maryland AAS

URINE; MARYLAND; ADULTS; ADOLESCENTS; CHROMIUM; DELIBERATE EXPOSURE

Borel, J.S.; Majerus, T.C.; Polansky, M.M.; Moser, P.B.; Anderson, R.A. 1984 Biological Trace Element Research 6:317-326

Tissue	Cases Exposure Route	Range	Mean	General Information
9106 Urine	a) 1 b) 1 c) 1 Ingestion	a) <0.2-1.3 umol/l b) <0.2-0.58 umol/l c) < or = detection limit	a) Not given b) Not given c) Not given	a) Operator of hide press b) Another operator of hide press c) Control, receptor of pressed hides Values estimated from graphs. Daily levels varied widely with tendency toward diurnal variation. Levels still high after 40-day vacation. 2 of authors ingested 5 mg (96 umol) Cr III as chloride soln. Levels in urine rose to 500 nmol/l, returned to normal within 24 hr (0.17% recovery). Workers in leather tannery AAS

CHROMIUM; URINE; OCCUPATIONAL EXPOSURE; FINLAND; DIURNAL VARIATIONS

Aitio, A.; Jarvisalo, J.; Kiilunen, M.; Tossavainen, A.; Vaittinen 1984 International Archives of Occupational and Environmental Health 54:241-249

Chromium

7440-47-3

Cr

AtW 51.996, MP 1900 C, BP 2642 C, VP 1 mm Hg at 1616 C, 10 mm Hg at 1840 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9107 Urine	22 Ingestion	4-16 nmol (0.2-0.8 ug)/d	8 nmol (0.4 ug)/d	Pooled samples from 5 d periods. Overall mean intake was 471 nmol/d (24.5 ug/d), range was 262-918 nmol/d (13.6-47.7 ug), below SADI but above American, British RDA's. 11 males, 11 females, 60-85 yr, healthy AAS

URINE; CHROMIUM; ADULTS; DIETS; AGE; METABOLISM; MINERAL METABOLISM; DELIBERATE EXPOSURE

Kanher, V.W.; Lawson, M.S.; Delves, H.T.; Clayton, B.E. 1984 American Journal of Clinical Nutrition 39:797-802

Tissue	Cases Exposure Route	Range	Mean	General Information
9108 Urine	9	a) Not given b) Not given	a) 0.37+/-0.06 ug/d b) 0.20+/-0.04 ug/d	a) Day of 6 mi run b) Non-run day Significant difference ($p<0.05$). Fasted from 10 hr before to 2 hr after run. Also measured phosphate. 23-46 yr old male runners AAS

BLOOD SERUM; URINE; CALCIUM; CHROMIUM; COPPER; POTASSIUM; SODIUM; ZINC; TRACE ELEMENTS; ADULTS

Anderson, R.A.; Polansky, M.M.; Bryden, N.A. 1984 Biological Trace Element Research 6:327-336

Tissue	Cases Exposure Route	Range	Mean	General Information
9109 Urine	a) 282 b) 16 c) 22 d) 42 e) 10	a) Not given b) Not given c) Not given d) Not given e) not given	a) 63+/-37 ug/L b) 35+/-21 ug/L c) 36+/-18 ug/L d) 44+/-18 ug/L e) 46+/-15 ug/L	a) Controls, (from general unexposed population) b) Possibly exposed (professionals, administrators, etc.) c) Low-exposure (plant superintendent, supervisors, foremen, fingerlift operators) d) Moderate-exposure (equipment operators, laborers, drivers, maintenance workers, warehousemen) e) High-exposure (treating plant operators) Employees in wood treatment process. Exposures to chromated Cu arsenate preservatives. Wood treaters: mean 41 ug/l. Controls: mean 63 ug/l. Hawaiians, Caucasians, Filipinos, Japanese AAS

WOOD PRESERVATIVES; ARSENIC; CHROMIUM; COPPER; URINE; HAWAII; COMPARATIVE EVALUATIONS; RACIAL STUDIES; OCCUPATIONAL EXPOSURE; HEALTH HAZARDS; INHALATION; OCCUPATIONAL HAZARDS

Takahashi, W.; Pfenninger, K.; Wong, L. 1983 Archives of Environmental Health 38(4):209-214

Chromium

7440-47-3
Cr
AtW 51.996, MP 1900 C, BP 2642 C, VP 1 mm Hg at 1616 C, 10 mm Hg at 1840 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9110 Urine	53 Inhalation	Not given	37 ug/l	After work shift. levels varied with those in air (r=0.72, P<0.001) 25-64 yr old stainless steel welders. Sweden AAS

WELDING; STEEL; URINE; COMPARATIVE EVALUATIONS; CHROMIUM; SWEDEN; HEALTH HAZARDS; INDUSTRIAL POLLUTION; INHALATION; OCCUPATIONAL HAZARDS; OCCUPATIONAL EXPOSURE

Sjorgren, B.; Hedstrom, L.; Ulfvarson, U. 1983 International Archives of Occupational and Environmental Health 51:347-354

Tissue	Cases Exposure Route	Range	Mean	General Information
9111 Urine	8 Inhalation	a) 19.8-67.2 ug b) Not given c) Not given d) Not given /g creatinine	a) 37.6 ug b) <0.9 ug c) 36.3 ug d) 49.7 ug /g creatinine	a) Welders, 10 cases, daily mean b) Controls, 8 cases c) Welders, before shift d) Welders, after shift Concentration of Cr and Ni in air correlated with urine levels and with retention of magnetic dust in lungs. Healthy stainless steel welders, 39+/-6 yr. Employed 13+/-6 yr. Controls in same factory but not exposed to fumes. AAS

BLOOD PLASMA; BLOOD; URINE; OCCUPATIONAL EXPOSURE; ADULTS; CHROMIUM; NICKEL; METALS; BIOLOGICAL MONITORING; INDUSTRIAL ATMOSPHERES; INHALATION

Rahkonen, E.; Junttila, M.-L.; Kalliomaki, L.; Olkinuora, M.; Koponen, M.; Kalliomaki, K. 1983 International Archives of Occupational and Environmental Health 52:243-255

Cobalt

7440-48-4
Co
AtW 58.9332, MP 1493 C, BP 3100 C, VP 1 mm Hg at 1910 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9113 Blood, plasma		a) Not given b) Not given c) Not given	a) 0.00043+/-0.00006 ug/mL b) 0.00057+/-0.00027 ug/mL c) 0.00037+/-0.00006 ug/mL	a) Insulin-treated diabetics b) Non-insulin-treated diabetics c) Control non-diabetics Collected after overnight fasting. Significant differences among all groups. 18-78 yr olds, Oxford, England NA; AAS

BLOOD PLASMA; ENGLAND; DIABETES; METABOLISM; MINERAL METABOLISM; ALUMINUM; ANTIMONY; ARSENIC; BARIUM; BROMINE; CADMIUM; CALCIUM; CESIUM; CHROMIUM; COBALT; COPPER; IODINE; IRON; LEAD; MAGNESIUM; MANGANESE; MERCURY; MOLYBDENUM; NICKEL; RUBIDIUM; SCANDIUM; SELENIUM; SILVER; TIN; VANADIUM; ZINC

Ward, N.I.; Pim, B. 1984 Biological Trace Element Research 6:469-487

Cobalt
7440-48-4
Co
AtW 58.9332, MP 1493 C, BP 3100 C, VP 1 mm Hg at 1910 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9115 Blood, serum	a) 20 b) 68 c) 36	a) Not given b) 2.7+/-0.1-3.7+/-0.2 ug/L c) 2.4+/-0.1-2.9+/-0.7 ug/L S.E.	a) 2.2+/-0.1 ug/L b) Not given c) Not given S.E.	a) Controls b) Patients with hypertension, acute myocardial ischemia, acute myocardial infarction c) Others Significant difference, a) and b). Ranges of means, b) and c) Controls from group 30-56 yr olds, 24% with family history of ischemia. 93 males, 18 females (diseases in b)) from 47-53 yr olds, 60% smokers, 30% family history of ischemia. Others - angina, infarction AAS
BLOOD SERUM; HEART DISEASES; HYPERTENSION; TRACE ELEMENTS; COPPER; ZINC; IRON; NICKEL; COBALT; SODIUM; POTASSIUM; CALCIUM; MAGNESIUM; PAKISTAN; COMPARATIVE EVALUATIONS; CHOLESTEROLS Khan, S.N.; Rahman, M.A.; Samad, A. 1984 Clinical Chemistry 30(5):644-648				

Tissue	Cases Exposure Route	Range	Mean	General Information
9114 Brain		a) 2X10(E-8)-3.5X10(E-8) b) 3.5X10(E-8)-5X10(E-8) c) 3.75X10(E-8)-4.25X10(E-8) d) 4.2X10(E-8)-6.0X10(E-8) e) Not applicable f) Not given g/g dry wt	a) Not given b) Not given c) Not given d) Not given e) 5X10(E-8) f) 6+/-1X10(E-8) g/g dry wt	a) Samples from 6 cerebral cortical regions, 3 alcohol abuse patients b) Normals c) Samples from 6 cerebral nuclei, alcohol abuse patients d) Normals e) Samples from caudate nucleus, endogeneous psychosis patient f) Normals Estimated from figure. Samples dissected 20-24 hr after death. 50-79 yr olds NA
BRAIN; AUTOPSIES; CASE HISTORIES; BEHAVIOR DISORDERS; COBALT; IRON; RUBIDIUM; ALCOHOLIC BEVERAGES; SELENIUM; ZINC Demmel, U.; Hock, A.; Feinendegen, L.E.; Sebek, P. 1984 Science of the Total Environment 38:69-77				

Tissue	Cases Exposure Route	Range	Mean	General Information
9115 Cerebrospinal fluid	a) 14 b) 20	a) 0.031-0.439 ug/g b) 0.015-0.166 ug/g Dry wt	a) 0.136 ug/g b) 0.059 ug/g Dry wt	a) Controls with functional disorders, headache, or cervical spondylosis b) Patients with motor neuron disease Significant difference between control and patient groups (Student's t test, p=0.0015). NA
CEREBROSPINAL FLUID; NERVOUS SYSTEM DISEASES; COBALT; TRACE ELEMENTS Mitchell, J.D.; Harris, I.A.; East, B.W.; Pentland, B. 1984 British Medical Journal 288:1791-1792				

Cobalt
7440-48-4
Co
AtW 58.9332, MP 1493 C, BP 3100 C, VP 1 mm Hg at 1910 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9116 Hair	a) 42 b) 56 c) 28 d) 21	a) 15-330 ug/kg b) 4-1700 ug/kg c) 14-150 ug/kg d) 2-92 ug/kg	a) 25 ug/kg b) 27 ug/kg c) 52 ug/kg d) 27 ug/kg	a) Caucasian boys b) Caucasian girls c) Hindustani children d) Creol, Chinese, and Javanese subjects, migrated from Surinam 5 g scalp hair from occipital region. 6 yr old school children living in Amsterdam suburb NA; AAS

HAIR; ENVIRONMENTAL EXPOSURE; NETHERLANDS; CHILDREN; SEX; BIOACCUMULATION; BIOLOGICAL MONITORING; DIETS; COPPER; ZINC; LEAD; IRON; CADMIUM; SELENIUM; COBALT; SILVER; GOLD
Herber, R.F.M.; Wibowo, A.A.E.; Das, H.A.; Egger, R.J.; van Deyck, W.; Zielhuis, R.L. 1983 International Archives of Occupational and Environmental Health 53:127-137

Tissue	Cases Exposure Route	Range	Mean	General Information
9117 Kidney	39	a) Not given b) Not given c) Not given d) Not given e) Not given	a) 3 ug/kg b) 3 ug/kg c) 6 ug/kg d) 3 ug/kg e) 1 ug/kg Medians, wet wt	a) Smelter workers, 10 with malignancies (38% of deaths): mean exposure 31.2 yr, mean length of retirement 8 yr b) 8 with cardiovascular disease (45% of deaths): mean exposure 31.4 yr, mean retirement 5.6 yr c) 3 with other diseases: mean exposure 26.7 yr, mean retirement 10.3 yr d) All 21 workers: mean exposure 30.4 yr, mean retirement 7.4 yr e) 8 controls. No malignancies, cardiovascular disease in 80% of deaths All autopsies, post-1975. No significant differences between smokers, ex-smokers and non-smokers. Copper smelter workers, northern Sweden, mean age 67.8 yr. Controls, rural residents, 50 km from smelter, mean age 67.9 yr NA
9118 Liver	38	a) Not given b) Not given c) Not given d) Not given e) Not given	a) 12 ug/kg b) 11 ug/kg c) 15 ug/kg d) 11 ug/kg e) 16 ug/kg Medians, wet wt	a) Smelter workers, 10 with malignancies (38% of deaths): mean exposure 31.2 yr, mean length of retirement 8 yr b) 8 with cardiovascular disease (45% of deaths): mean exposure 31.4 yr, mean retirement 5.6 yr c) 2 with other diseases: mean exposure 26.7 yr, mean retirement 10.3 yr d) All 20 workers: mean exposure 30.4 yr, mean retirement 7.4 yr e) 8 controls. No malignancies, cardiovascular disease in 80% of deaths All autopsies, post-1975. No significant differences between smokers, ex-smokers and non-smokers. Copper smelter workers, northern Sweden, mean age 67.8 yr. Controls, rural residents, 50 km from smelter, mean age 67.9 yr NA

KIDNEYS; LIVER; LUNGS; OCCUPATIONAL EXPOSURE; ENVIRONMENTAL EXPOSURE; SWEDEN; AUTOPSIES; CARCINOMAS; CARDIOVASCULAR DISEASES; NEOPLASMS; CHROMIUM; COBALT; LANTHANUM; SMELTERS
Gerhardsson, L.; Wester, P.O.; Nordberg, G.F.; Brune, D. 1986 Science of the Total Environment 37:233-246

Cobalt
7440-48-4
Co
AtW 58.9332, MP 1495 C, BP 3100 C, VP 1 mm Hg at 1910 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9110 Liver	96	a) 0.06-0.24 mg/kg b) 0.02-0.50 mg/kg	a) 0.14 +or- 0.05 mg/kg b) 0.12 +or- 0.06 mg/kg	a) Females b) Males Autopsies. Levels generally lower than those in other countries. No major regional variations. New Zealanders. Death by physical injuries AAS

LIVER; COMPARATIVE EVALUATIONS; ARSENIC; CADMIUM; CHROMIUM; COBALT; COPPER; NEW ZEALAND; AUTOPSIES; LEAD; MANGANESE; MERCURY; NICKEL; SELENIUM; SILVER; ZINC
Pickston, L.; Lewin, J.F.; Drysdale, J.M.; Smith, J.M.; Bruce, J. 1983 Journal of Analytical Toxicology 7:2-6

Tissue	Cases Exposure Route	Range	Mean	General Information
9120 Lung	79	a) Not given b) Not given c) Not given d) Not given e) Not given	a) 16 ug/kg b) 16 ug/kg c) 15 ug/kg d) 15 ug/kg e) 7 ug/kg Medians, wet wt	a) Smelter workers, 24 with malignancies (33% of deaths): mean exposure 31.2 yr, mean length of retirement 8 yr b) 29 with cardiovascular disease (45% of deaths): mean exposure 31.4 yr, mean retirement 5.6 yr c) 12 with other diseases: mean exposure 26.7 yr, mean retirement 10.3 yr d) All 79 workers: mean exposure 30.4 yr, mean retirement 7.4 yr e) 14 controls. No malignancies, cardiovascular disease in 80% of deaths All autopsies, post-1975. No significant differences between smokers, ex-smokers and non-smokers. Copper smelter workers, northern Sweden, mean age 67.8 yr. Controls, rural residents, 50 km from smelter, mean age 67.9 yr NA

KIDNEYS; LIVER; LUNGS; OCCUPATIONAL EXPOSURE; ENVIRONMENTAL EXPOSURE; SWEDEN; AUTOPSIES; CARCINOMAS; CARDIOVASCULAR DISEASES; NEOPLASMS; CHROMIUM; COBALT; LANTHANUM; SMELTERS
Gerhardsson, L.; Wester, P.O.; Nordberg, G.F.; Brune, D. 1984 Science of the Total Environment 37:233-246

Tissue	Cases Exposure Route	Range	Mean	General Information
9121 Milk	a) 10 b) 5	a) <10-<10 ug/kg b) <or= 1.0-2.0 ug/kg Dry wt	a) Not given b) Not given	a) Colostrum (1st or 2nd day post partum) b) Transitional milk (3-5 days post partum) Slovenia, Yugoslavia NA

MILK; ARSENIC; CADMIUM; COBALT; COPPER; MERCURY; IODINE; MANGANESE; ANTIMONY; SELENIUM; VANADIUM; ZINC; YUGOSLAVIA; ENVIRONMENTAL EXPOSURE
Kosta, L.; Byrne, A.R.; Dermelj, M. 1983 Science of the Total Environment 29:261-268

Copper
7440-50-8
Cu
AtW 63.546, MP 1083 C, BP 2595 C, VP 1 mm Hg at 1628 C, 10 mm Hg at 1870 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9122 Aorta	a) 8 b) 6 c) 7	a) 5.2-9 ppm Dry wt b) 8-14 ppm Dry wt c) Not given	a) Not given b) Not given c) 6.6+/-2.6 ppm Dry wt	a) Sclerotic aorta from metal-worzers b) Normal aorta from metal-workers c) Notmal aorta from non metal-workers 45-66 yr old workers. Autopsies, Japan, 1976-1977. Employed 7-32 yr ES
AORTA; VERTEBRAE; BONES; ENVIRONMENTAL EXPOSURE; OCCUPATIONAL EXPOSURE; JAPAN; AUTOPSIES; CADAVERS; CARDIOVASCULAR DISEASES; MINERALS; BIOACCUMULATION; DIETS; FOODS; MINERAL DEPOSITS; CALCIUM; PHOSPHORUS; IRON; MAGNESIUM; ZINC; ALUMINUM; COPPER; CADMIUM; LEAD; NICKEL; VANADIUM; CHROMIUM; MANGANESE; SILICON; TIN; TITANIUM; STRONTIUM Tsuchiya, H. 1984 Archives of Environmental Contamination and Toxicology 13:119-127				

Tissue	Cases Exposure Route	Range	Mean	General Information
9128 Blood	281	a) 0.18-2.38 ug/g b) 0.16-2.27 ug/g Wet wt	a) 1.04+/-0.35 ug/g b) 0.86+/-0.32 ug/g Wet wt	a) Maternal, 107 cases b) Cord, 96 cases Significant positive correlation. Determinations over 5-yr period. Nagoya, Japan, 1974-1978. Maternal venous and umbilical cord blood, normal deliveries. AAS
ZINC; MERCURY; METHYLMERCURY; LEAD; CADMIUM; MANGANESE; COPPER; IRON; JAPAN; BLOOD; PLACENTA; UMBILICAL CORD; METALS; ENVIRONMENTAL EXPOSURE Tsuchiya, H.; Mitani, K.; Kodama, K.; Nakata, T. 1984 Archives of Environmental Health 39(1):11-17				

Tissue	Cases Exposure Route	Range	Mean	General Information
9124 Blood	a) 24 b) 50 Ingestion	a) 10.3-16.3 umol/l b) 11.2-19.4 umol/l	a) 13.4+/-1.7umol/l b) 14.0+/-1.5 umol/l	a) Elderly b) Younger controls Intake, men, 19.7 umol/day (range 13.3-26.7), women 20.5 umol/day (range 10.2-47.5). Intake 64% of lower limit (8.8 umol/day). Average retention, -0.8 umol/day, not significantly different from 0. No apparent health effects from deficiency. Healthy elderly (11 men, 73.3-85.2 yr (mean 78.2), 13 women 69.7-85.5 yr (mean 75.8)) and younger controls, Southampton, England AAS
BLOOD; BLOOD PLASMA; LEUKOCYTES; URINE; DELIBERATE EXPOSURE; UNITED KINGDOM; ADULTS; COPPER; ZINC; METALS Bunker, V.W.; Hinks, L.J.; Lawson, M.S.; Clayton, B.E. 1984 American Journal of Clinical Nutrition 40:1096-1102				

Copper

7440-50-8

Cu

AtW 63.546, MP 1083 C, BP 2595 C, VP 1 mm Hg at 1628 C, 10 mm Hg at 1870 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9125 Blood		a) 0.8-1.1 ug/ml b) 1-1.4 ug/ml	a) Not given b) Not given	a) Males b) Females Consistent results for all components of blood. High values in some Australian Aboriginal settlements (>1.4 ug/ml) and Tokelau, New Zealand (1.7 ug/ml). Levels from database containing data on "normal" levels of 15 elements in 7 tissues/fluids. Data selected by 60 investigators in over 40 countries. Diet, environment both important in distribution of elements.
ZINC; COPPER; MANGANESE; SELENIUM; LEAD; CADMIUM; BLOOD; BLOOD SERUM; HAIR; MILK; BANGLADESH; INDIA; TURKEY; FINLAND; ITALY; NEW ZEALAND; GUATEMALA; CHILE; SWEDEN; HUNGARY; YUGOSLAVIA; POLAND; KENYA; EGYPT; SOUTH AFRICA; UNITED STATES; AUSTRALIA; GREECE; PAKISTAN; NIGERIA; PHILIPPINES; ZAIRE; THAILAND; CHINA; WYOMING; OHIO; CALIFORNIA; JAPAN; MEXICO; CANADA; ISRAEL; PERU; SPAIN; COMPARATIVE EVALUATIONS; BIOLOGICAL MONITORING; IRAN; DIETS; ENVIRONMENTAL EXPOSURE Iyengar, G.V. 1984 Science of the Total Environment 38:125-131				

Tissue	Cases Exposure Route	Range	Mean	General Information
9126 Blood	a) 4 b) 2 Ingestion	a) 91-99 ug/g b) 89-129 ug/g	a) 94 ug/g b) 109 ug/g Medians	a) Family in 5th house, at end of Cu-water main installed 1975. Intoxication and median Cu in water of 3.07 mg/L. Symptoms resolved when stopped drinking water b) Family in 2nd house served by main. Blood-Cu in normal range (70-155 ug/g). Median Cu in water was 1.58 mg/L Three Vermont families, median ages, ranges were 20 yr (5-34), 8 yr (3-34), 15 yr (1-36) Chronic abdominal pain, emesis AAS
ENVIRONMENTAL EXPOSURE; COPPER; BLOOD; HAIR; WATER POLLUTION; VERMONT Spitalny, K.C.; Brondum, J.; Vogt, R.L.; Sargent, H.E.; Kappel, S. 1984 Pediatrics 74(6):1103-1106				

Copper
7440-50-8
Cu
AtW 63.546, MP 1083 C, BP 2595 C, VP 1 mm Hg at 1628 C, 10 mm Hg at 1870 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9127 Blood, cells	a) 24 b) 50 Ingestion	a) 7.4-21.8 pmol b) 4.2-17.0 pmol /10(E+6) cells	a) 11.5+/-3.6 pmol b) 10.9+/-3.3 pmol /10(E+6) cells	a) Elderly b) Younger controls Intake, men, 19.7 umol/day (range 13.2-36.7), women 20.5 umol/day (range 10.2-47.8). Intake 64% of lower limit (8.5 umol/day). Average retention, -0.8 umol/day, not significantly different from 0. No apparent health effects from deficiency. Healthy elderly (11 men, 73.3-85.2 yr (mean 78.2), 13 women 69.7-85.5 yr (mean 75.8)) and younger controls, Southampton, England AAS
9128 Blood, plasma	a) 24 b) 50 Ingestion	a) 12.4-26.9 umol/l b) 12.4-23.5 umol/l	a) 19.4+/-3.4 umol/l b) 16.4+/-2.4 umol/l	a) Elderly b) Younger controls Intake, men, 19.7 umol/day (range 13.2-36.7), women 20.5 umol/day (range 10.2-47.8). Intake 64% of lower limit (8.5 umol/day). Average retention, -0.8 umol/day, not significantly different from 0. No apparent health effects from deficiency. Healthy elderly (11 men, 73.3-85.2 yr (mean 78.2), 13 women 69.7-85.5 yr (mean 75.8)) and younger controls, Southampton, England AAS
BLOOD; BLOOD PLASMA; LEUKOCYTES; URINE; DELIBERATE EXPOSURE; UNITED KINGDOM; ADULTS; COPPER; ZINC; METALS				
Bunker, V.W.; Hinks, L.J.; Lawson, M.S.; Clayton, B.E. 1984 American Journal of Clinical Nutrition 40:1096-1102				

Tissue	Cases Exposure Route	Range	Mean	General Information
9129 Blood, plasma	29 Ingestion	a) Not given b) Not given c) Not given d) Not given	a) 168.5+/-40 ug/dl b) 182.6+/-56.5 ug/dl c) 121.0+/-30.9 ug/dl d) 125.6+/-34.2 ug/dl	a) Vegetarians, 36.5+/-2.0 wk gestation, 11 cases b) Nonvegetarians, 37.5+/-2.0 wk gestation, 13 cases c) Vegetarians, 11+/-9 wk postpartum, 6 cases d) Nonvegetarians, 10+/-7 wk postpartum, 12 cases No significant differences between dietary groups. Healthy volunteers, 19 Caucasians, 9 Mexican-Americans, 1 Oriental, 25-36 yr old AAS
BLOOD PLASMA; ENVIRONMENTAL EXPOSURE; ADULTS; NUTRITIONAL DISORDERS; COPPER; ZINC; BIOACCUMULATION; DIETS; FOODS; MEAT; PREGNANCY; VEGETABLES				
Abu-Assal, M.J.; Craig, W.J. 1984 Nutritional Reports International 29(2):485-493				

Copper
7440-50-8
Cu
AtW 63.546, MP 1083 C, BP 2595 C, VP 1 mm Hg at 1628 C, 10 mm Hg at 1870 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9130 Blood, plasma		a) Not given b) Not given c) Not given	a) 0.99+/-0.06 ug/mL b) 1.07+/-0.2[illegible] ug/mL c) 1.01+/-0.07 ug/mL	a) Insulin-treated diabetics b) Non-insulin-treated diabetics c) Control non-diabetics Collected after overnight fasting. Significant difference between a) and b). 16-76 yr olds, Oxford, England NA; AAS
BLOOD PLASMA; ENGLAND; DIABETES; METABOLISM; MINERAL METABOLISM; ALUMINUM; ANTIMONY; ARSENIC; BARIUM; BROMINE; CADMIUM; CALCIUM; CESIUM; CHROMIUM; COBALT; COPPER; IODINE; IRON; LEAD; MAGNESIUM; MANGANESE; MERCURY; MOLYBDENUM; NICKEL; RUBIDIUM; SCANDIUM; SELENIUM; SILVER; TIN; VANADIUM; ZINC Ward, N.I.; Pim, B. 1984 Biological Trace Element Research 6:469-487				

Tissue	Cases Exposure Route	Range	Mean	General Information
9131 Blood, serum	259	a) Not given b) Not given c) Not given	a) 32.5 (2SD 5.5) umol/L b) 25.5 (2SD 7.7) umol/L c) 25.2 (2SD 5.4) umol/L	a) 244 normal pregnancies b) 9 anencephalic pregnancies c) 4 subsequent spontaneous abortions Highly significant differences in levels in pregnancies with anencephaly or with subsequent abortions Referrals for measurement of serum alpha-fetoprotein AAS
COPPER; BLOOD SERUM; PREGNANCY; UNITED KINGDOM; COMPARATIVE EVALUATIONS Buamah, P.K.; Russell, M.; Milford-Ward, A; Taylor, P.; Roberts, D.F. 1984 Clinical Chemistry 30(10):1676-1677				

Tissue	Cases Exposure Route	Range	Mean	General Information
9132 Blood, serum	103	0.55-2.3 ug/mL	1.25+/-0.30 ug/mL	Technique developed for simultaneous determination of several elements. Also measured detection limits for other elements. x-ray fluores
MEASUREMENT METHODS; BLOOD SERUM; IRON;COPPER; ZINC; BROMINE; TRACE ELEMENTS Rastegar, F.; Maier, E.A.; Heimburger, R.; Christophe, C.; Ruch, C.; Leroy, M.J. 1984 Clinical Chemistry 30(8):1300-1303				

Copper

7440-50-8

Cu

AtW 63.546, MP 1083 C, BP 2595 C, VP 1 mm Hg at 1628 C, 10 mm Hg at 1870 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9138 Blood, serum	9 Ingestion	a) 63-105 ug/dL b) Not given c) Not given d) Not given	a) 79+/-4 ug/dL b) 79+/-4 ug/dL c) 78+/-2 ug/dL d) 79+/-2 ug/dL S.E.	a) Day 1 b) Uncured c) Cured, 49 mg/kg nitrite d) Cured, 47 mg/kg nitrite + 200 mg/kg erythorbate 200 g/day cured or uncured sausage. 3 subjects/group, each set rotating to next group every 17d. Sampled day 10 and 15 and data pooled. Healthy, 21-27 yr old. Mean ht 180 cm, mean wt 78 kg AAS
BIOAVAILABILITY; IRON; ZINC; COPPER; DELIBERATE EXPOSURE; METABOLISM; URINE; BLOOD SERUM; UNITED STATES Greger, J.L.; Lee, K.; Graham, K.L.; Chinn, B.L.; Liebert, J.C. 1984 Journal of Agricultural and Food Chemistry 32:861-865				

Tissue	Cases Exposure Route	Range	Mean	General Information
9154 Blood, serum	a) 51 b) 19 c) 21 d) 20	a) 1.05+/-0.23-1.16+/-0.35 b) 1.13+/-0.23-1.15+/-0.20 c) 1.02+/-0.19-1.07+/-0.13 d) 0.92+/-0.20-1.27+/-0.30 mg/l	a) Not given b) Not given c) Not given d) Not given	a) Controls, non-exposed b) Patients with Itai-itai disease - renal damage and bone lesions c) Patients suspected of having disease - renal damage, no obvious bone lesions d) Exposed - no bone or renal disorders Ranges of means, a)-d) environmentally exposed. 30-70 yr old women AAS
URINE; BLOOD SERUM; ENVIRONMENTAL EXPOSURE; JAPAN; COPPER; CADMIUM; ZINC; KIDNEY DISEASES Nogawa, K.; Yamada, Y.; Honda, R.; Tsuritani, I.; Kobayashi, E.; Ishizaki, M. 1984 Environmental Research 33:29-38				

Tissue	Cases Exposure Route	Range	Mean	General Information
9185 Blood, serum	9	a) Not given b) Not given c) Not given	a) 93+/-5 ug/dL b) 95+/-4 ug/dL c) 94+/-4 ug/dL	a) Immediately before 6 mi run b) Immediately after run c) 2 hr after run Significant difference a), c) ($p<0.05$). Fasted from 10 hr before to 2 hr after run. Also measured cholesterol, triglycerides, bilirubin, albumin, protein, uric acid, urea, phosphate, and alkaline phosphatase. 23-46 yr old male runners AAS
BLOOD SERUM; URINE; CALCIUM; CHROMIUM; COPPER; POTASSIUM; SODIUM; ZINC; TRACE ELEMENTS; ADULTS Anderson, R.A.; Polansky, M.M.; Bryden, N.A. 1984 Biological Trace Element Research 6:327-336				

Copper

7440-50-8

Cu

AtW 63.546, MP 1083 C, BP 2595 C, VP 1 mm Hg at 1628 C, 10 mm Hg at 1870 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9186 Blood, serum	a) 30 b) 150	a) Not given b) 1795+/-55-2393+/-59 ug/L S.E.	a) 1556+/-55 ug/L b) Not given S.E.	a) Controls b) Patients with ischemic heart disease and hypertension Range of means. Significantly different. Controls from group of 30-56 yr olds (42 males, 8 females), 24% with family history of ischemic heart disease. 30-80 yr old patients (138 males, 21 females), 62% smokers, 27% with similar family history AAS
BLOOD SERUM; HEART DISEASES; HYPERTENSION; TRACE ELEMENTS; COPPER; ZINC; IRON; NICKEL; COBALT; SODIUM; POTASSIUM; CALCIUM; MAGNESIUM; PAKISTAN; COMPARATIVE EVALUATIONS; CHOLESTEROLS Khan, S.N.; Rahman, M.A.; Samad, A. 1984 Clinical Chemistry 30(5):644-648				

Tissue	Cases Exposure Route	Range	Mean	General Information
9187 Blood, whole	a) 55 b) 54 c) 136 d) 104 e) 155 f) 128 g) 150 h) 164	a) 0.79-1.44 mg/l b) 0.79-1.64 mg/l c) 0.80-1.56 mg/l d) 0.69-1.78 mg/l e) 0.71-1.47 mg/l f) 0.75-1.54 mg/l g) 0.85-1.51 mg/l h) 0.81-1.68 mg/l	a) 1.12 mg/l b) 1.11 mg/l c) 1.08 mg/l d) 1.05 mg/l e) 1.15 mg/l f) 1.14 mg/l g) 1.11 mg/l h) 1.08 mg/l Medians	a) 2-3 yr old males b) 2-3 yr old females c) 4-5 yr old males d) 4-5 yr old females e) 9 yr old males f) 9 yr old females g) 12 yr old males h) 12 yr old females Levels independent of age and sex. Levels in normal range. Cd levels below detection limit 0.50 ng/ml. 2-12 yr olds, Kamloops, British, Columbia AAS
BLOOD; CHILDREN; COPPER; LEAD; ZINC; SEX; AGE; COMPARATIVE EVALUATIONS Subramanian, K.S.; Meranger, J.C. 1983 Science of the Total Environment 30:231-244				

Tissue	Cases Exposure Route	Range	Mean	General Information
9188 Bone	1	Not given	4.6+/-1.1 ppm Dry wt	Lumbar vertebrae (n=5). Chromate plating worker, employed 7 yr, died at age 66, 30 yr after changing jobs ES
AORTA; VERTEBRAE; BONES; ENVIRONMENTAL EXPOSURE; OCCUPATIONAL EXPOSURE; JAPAN; AUTOPSIES; CADAVERS; CARDIOVASCULAR DISEASES; MINERALS; BIOACCUMULATION; DIETS; FOODS; MINERAL DEPOSITS; CALCIUM; PHOSPHORUS; IRON; MAGNESIUM; ZINC; ALUMINUM; COPPER; CADMIUM; LEAD; NICKEL; VANADIUM; CHROMIUM; MANGANESE; SILICON; TIN; TITANIUM; STRONTIUM Terasoka, H. 1984 Archives of Environmental Contamination and Toxicology 13:119-127				

Copper

7440-50-8

Cu

AtW 63.546, MP 1083 C, BP 2595 C, VP 1 mm Hg at 1628 C, 10 mm Hg at 1870 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9139 Breast	22	a) Not given b) Not given	a) 9.3+/-2.3 ug/g b) 21.0+/-10.7 ug/g	a) Normal tissue b) Neoplastic Dry wt, 3 samples, p=0.0001 Patients with primary breast carcinoma, samples of normal and neoplastic tissue obtained at time of mastectomy X-ray fluorescence
BREAST; CALCIUM; VANADIUM; CHROMIUM; MANGANESE; IRON; NICKEL; COPPER; ZINC; ARSENIC; SELENIUM; BROMINE; RUBIDIUM; STRONTIUM; MOLYBDENUM; LEAD; MERCURY; NEOPLASMS Rink, S.L.; Sky-Peck, H.H. 1984 Cancer Research 44:5390-5394				

Tissue	Cases Exposure Route	Range	Mean	General Information
9140 Breast fluid	Ingestion	a) Not given b) Not given c) Not given d) Not given	a) 0.51+/-0.20 ug/g b) 0.61+/-0.29 ug/g c) 0.46+/-0.8 ug/g d) 0.41+/-0.12 ug/g	a) Middle income, 3-5 days post partum, 6 cases b) Low income, 3-5 days post partum, 9 cases c) Middle income, 4-6 wks post partum, 8 cases d) Low income, 4-6 wks post partum, 8 cases Differences not statistically significant Mothers in Hyderabad, India NA
MILK; INDIA; ADULTS; COPPER; MANGANESE; MOLYBDENUM; ZINC; DIETS; LACTATION; NEWBORN; NUTRITIONAL DEFICIENCIES Dang, H.S.; Jaiswal, D.D.; Somasundaram, S.; Deshpande, A.; Dacosta, H. 1984 Science of the Total Environment 35: 85-89				

Tissue	Cases Exposure Route	Range	Mean	General Information
9141 Cerebrospinal fluid	a) 10 b) 8 c) 3 d) 6 e) 3 f) 1 g) 1	a) Not given b) Not given c) Not given d) Not given e) Not given f) Not given g) Not given	a) 39.8+/-24.7 ug/l b) 53.2+/-36.8 ug/l c) 41.1+/-15.4 ug/l d) 56.7+/-37.5 ug/l e) 109+/-95.4 ug/l f) 147 ug/l g) 24 ug/l	a) Controls, non-neoplasmic diseases (hydrocephalus, etc.) b) Meningioma c) Craniopharyngioma d) Astrocytoma e) Medulloblastoma f) Pinealblastoma g) Chondrosarcoma b, c) Benign brain tumors, (d-g) malignant brain tumors No significant differences. Patients, 18 men, 14 women, range of mean ages 4.6-55.0 yr, fasted 8-12 hr AAS
CEREBROSPINAL FLUID; SAUDI ARABIA; CARCINOMAS; NEOPLASMS; SARCOMAS; ALUMINUM; ANTIMONY; BISMUTH; CADMIUM; COPPER; GOLD; LEAD; SELENIUM; SILVER El-Yazigi, A.; Al-Saleh, I.; Al-Mefty, O. 1984 Clinical Chemistry 30:1358-1360				

Copper
7440-50-8
Cu
AtW 63.546, MP 1083 C, BP 2595 C, VP 1 mm Hg at 1628 C, 10 mm Hg at 1870 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9142 Hair	a) 161 b) 24	a) 4-136 ppm b) 8-163 ppm	a) 15.0 ppm b) 28.2 ppm	a) Pottery workers b) Controls Pottery workers from Tlaquepaque and Tonala, Mexico. Controls from Tucson, AZ AAS
HAIR; OCCUPATIONAL EXPOSURE; ARIZONA; MEXICO; ADULTS; LEAD; CADMIUM; ARSENIC; VANADIUM; GOLD; ZINC; COPPER; IRON; MANGANESE; POTASSIUM Weber, C.W.; Nelson, G.W.; deVaquera, M.V.; Pearson, P.B. 1984 Nutrition Reports International 30(5):1009-1018				

Tissue	Cases Exposure Route	Range	Mean	General Information
9143 Hair		a) Not given b) Not given c) Not given d) Not given e) Not given	a) 39 ug/g b) 7 ug/g c) 10 ug/g d) 10 ug/g e) 11 ug/g	a) Australia b) Bangladesh c) Pakistan d) Nigeria e) Turkey Most frequent values from several countries were 15-25 ug/g. Levels from database containing data on "normal" levels of 15 elements in 7 tissues/fluids. Data selected by 60 investigators in over 40 countries. Diet, environment both important in distribution of elements.
ZINC; COPPER; MANGANESE; SELENIUM; LEAD; CADMIUM; BLOOD; BLOOD SERUM; HAIR; MILK; BANGLADESH; INDIA; TURKEY; FINLAND; ITALY; NEW ZEALAND; GUATEMALA; CHILE; SWEDEN; HUNGARY; YUGOSLAVIA; POLAND; KENYA; EGYPT; SOUTH AFRICA; UNITED STATES; AUSTRALIA; GREECE; PAKISTAN; NIGERIA; PHILIPPINES; ZAIRE; THAILAND; CHINA; WYOMING; OHIO; CALIFORNIA; JAPAN; MEXICO; CANADA; ISRAEL; PERU; SPAIN; COMPARATIVE EVALUATIONS; BIOLOGICAL MONITORING; IRAN; DIETS; ENVIRONMENTAL EXPOSURE Iyengar, G.V. 1984 Science of the Total Environment 38:125-131				

Tissue	Cases Exposure Route	Range	Mean	General Information
9144 Hair	84	a) Not given b) Not given	a) 21+/-3 ppm b) 40+/-15 ppm	a) Hypertensives b) Controls Statistically not significant 20 adult black females classified as hypertensive, 14 adult black normotensive females AAS
HAIR; ENVIRONMENTAL EXPOSURE; MISSISSIPPI; ADULTS; HYPERTENSION; CARDIOVASCULAR DISEASES; LEAD POISONING; METAL POISONING; BIOPSIES; CADMIUM; COPPER; LEAD; ZINC; METALS; BIOACCUMULATION; BIOLOGICAL MONITORING Medeiros, D.M.; Pellum, L.K. 1984 Bulletin of Environmental Contamination and Toxicology 32:525-532				

Copper
7440-50-8
Cu
AtW 63.546, MP 1083 C, BP 2595 C, VP 1 mm Hg at 1628 C, 10 mm Hg at 1870 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9145 Hair	a) 4 b) 6 c) 5 d) 11 e) 10	a) 12-37 ppm b) 15-100 ppm c) 20-22 ppm d) 13-72 ppm e) 14-43 ppm	a) 20 ppm b) 36 ppm c) 21 ppm d) 40 ppm e) 27 ppm	a) 1-15 yr olds, rural b) 15-25 yr olds, rural c) 25 yr olds, rural d) 15-25 yr olds, different areas of country e) All age groups, different areas of country 15-25 yr olds had highest levels of trace elements. Residents of Sri Lanka AAS

HAIR; ENVIRONMENTAL EXPOSURE; SRI LANKA; CHILDREN; ADULTS; LEAD POISONING; METAL POISONING; CALCIUM; MAGNESIUM; IRON; MANGANESE; COPPER; ZINC; LEAD; AUTOMOTIVE; AIR POLLUTION; BIOACCUMULATION; HEALTH HAZARDS; LAND POLLUTION; POPULATION EXPOSURE; RURAL AREAS; URBAN AREAS; AGE
Dissanayake, C.B.; Senaratne, A.; Weerasooriya, S.V.R. 1984 Journal of Environmental Studies 23:41-48

Tissue	Cases Exposure Route	Range	Mean	General Information
9146 Hair	a) 4 b) 4 c) 4 Ingestion	a) 180-1200 ug/g b) 49-160 ug/g c) 12-15 ug/g	a) 155 ug/g b) 94 ug/g c) 29 ug/g	a) Family in 5th house, at end of Cu-water main installed 1975. Intoxication and median Cu in water of 3.07 mg/L. Symptoms resolved when stopped drinking water b) Family in 2nd house served by main. Blood-Cu in normal range (70-155 ug/g). Median Cu in water was 1.55 mg/L a c) Family also served by main. Blood-Cu in normal range. Hair Cu in normal range, 11-40 ug/g. Median Cu in water was 0.02 mg/L. AAS

ENVIRONMENTAL EXPOSURE; COPPER; BLOOD; HAIR; WATER POLLUTION; VERMONT
Spitalny, K.C.; Brondum, J.; Vogt, R.L.; Sargent, H.E.; Kappel, S. 1984 Pediatrics 74(6):1103-1106

Tissue	Cases Exposure Route	Range	Mean	General Information
9147 Hair	a) 60 b) 51 c) 5 d) 13	a) Not given b) Not given c) Not given d) Not given	a) 46.0 (2.4) ug/g b) 57.3 (2.0) ug/g c) 20.1 (2.0) ug/g d) 26.8 (3.0) ug/g Geometric means	a) Total, unwashed hair samples b) Hair pieces c) Needle-pads d) Others (undefined) In unwashed samples, significant difference between sample types ($p<0.01$), and between dates of cutting ($p<0.01$). After washing (non-ionic SAA), levels significantly higher in 1911-1965 samples than in 1981-1983. Japanese women. 1981-1983 samples from 22 workers at National Institute of Environmental Studies Atomic emission spectrometry; AAS

HAIR; ENVIRONMENTAL EXPOSURE; JAPAN; COMPARATIVE EVALUATIONS; CALCIUM; COPPER; IRON; LEAD; MAGNESIUM; MANGANESE; MERCURY; MERCURY ORGANIC COMPOUNDS; METALS; MINERALS; PHOSPHORUS; POTASSIUM; SODIUM; STRONTIUM; TRACE ELEMENTS; ZINC; OCCUPATIONAL EXPOSURE
Suzuki, T.; Hongo, T.; Morita, M.; Yamamoto, R. 1984 Science of the Total Environment 39:81-91

Copper
7440-50-8
Cu
AtW 63.546, MP 1083 C, BP 2595 C, VP 1 mm Hg at 1628 C, 10 mm Hg at 1870 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9148 Hair	a) 51 b) 52	a) 8.5-17.9 ug/g b) 10.4-14.0 ug/g 25th-75th percentiles	a) 11.0 ug/g b) 12.1 ug/g Medians	a) Drank hard tapwater (mean hardness 330 ppm) at least 1 yr b) Drank soft tapwater (mean hardness 33 ppm) No significant difference Healthy Caucasian preschool children matched by age (4.5-5.5 yr old), sex, and socioeconomic status, Guelph, Ontario (hard water area) and Halifax, Nova Scotia (soft water area), Canada NA
CANADA; AGE; CHILDREN; SEX; NUTRITIONAL DEFICIENCIES; HAIR; CALCIUM; COPPER; MANGANESE; ZINC; DRINKING WATER; ENVIRONMENTAL EXPOSURE; DELIBERATE EXPOSURE Gibson, R.S.; Anderson, B.M.; Scythes, C.A. 1983 American Journal of Clinical Nutrition 37:37-43				

Tissue	Cases Exposure Route	Range	Mean	General Information
9140 Hair	a) 48 b) 55 c) 38 d) 21	a) 2.60-55 mg/kg b) 2.0-250 mg/kg c) 3.20-47.0 mg/kg d) 3.50-52.0 mg/kg	a) 6.48 mg/kg b) 7.60 mg/kg c) 7.35 mg/kg d) 9.30 mg/kg	a) Caucasian boys b) Caucasian girls c) Hindustani children d) Creal, Chinese, and Javanese subjects, migrated from Surinam 5 g scalp hair from occipital region. 8 yr old school children living in Amsterdam suburb NA; AAS
HAIR; ENVIRONMENTAL EXPOSURE; NETHERLANDS; CHILDREN; SEX; BIOACCUMULATION; BIOLOGICAL MONITORING; DIETS; COPPER; ZINC; LEAD; IRON; CADMIUM; SELENIUM; COBALT; SILVER; GOLD Herber, R.F.M.; Wibowo, A.A.E.; Das, H.A.; Egger, R.J.; van Deyck, W.; Zielhuis, R.L. 1983 International Archives of Occupational and Environmental Health 53:127-137				

Tissue	Cases Exposure Route	Range	Mean	General Information
9150 Hair	a) 34 b) 62 c) 26 d) 13	a) Not given b) Not given c) Not given d) Not given	a) 49+/-8 ug/g b) 46+/-7 ug/g c) 46+/-14 ug/g d) 26+/-9 ug/g	a) Blond hair, 0-100 MU melanin b) Light brown hair, 101-200 MU melanin c) Dark brown hair, 201-300 MU melanin d) Black hair, >301 MU melanin Zn:Cu significantly higher in black hair (>301 MU melanin). 1-12 yr old healthy males, Brasilia, Brasil AAS
HAIR; BRAZIL; CHILDREN; ZINC; COPPER; MINERALS; METALS; ENVIRONMENTAL EXPOSURE Dorea, J.G.; Pereira, S.E. 1983 Journal of Nutrition 113:2375-2381				

Copper

7440-50-8

Cu

AtW 63.546, MP 1083 C, BP 2595 C, VP 1 mm Hg at 1628 C, 10 mm Hg at 1670 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9151 Hair	6	a) 5-250 ug/g b) 10-115 ug/g c) 5-85 ug/g d) 5-50 ug/g e) 5-35 ug/g f) 5-65 ug/g Estimated from figure	a) 18 ug/g b) 17 ug/g c) 12 ug/g d) 16 ug/g e) 8.5 ug/g f) 6.9 ug/g	a) 0-40 cm from scalp, 7 yr old female b) 0-40 cm from scalp, 4 yr old female c) 0-30 cm from scalp, 7 yr old female d) 0-18 cm from scalp, 5 yr old female e) 0-15 cm from scalp, 2 yr old male f) 0-65 cm from scalp, 40 yr old female Range from total length, mean from 1st 10 cm from scalp. Sharp increase in levels near tip of children's hair. Japan NA
HAIR; ENVIRONMENTAL EXPOSURE; JAPAN; ADULTS; CHILDREN; COMPARATIVE EVALUATIONS; BROMINE; CALCIUM; CHLORINE; COPPER; IODINE; MAGNESIUM; MANGANESE; MERCURY; SELENIUM; ZINC; BIOINDICATORS Yukawa, M.; Suzuki-Yasumoto, M.; Tanaka, S. 1984 Science of the Total Environment 38:41-54				

Tissue	Cases Exposure Route	Range	Mean	General Information
9152 Kidney	32	Not given	17.4+/-3 ug/g Dry wt	Cortex. Age had only slight influence if data not adjusted for gender. 16-60 yr old Caucasians autopsied in 1979-1981. Also measured: heart wt, body wt, height. Selected from group of 60. Cancer, kidney failure, extensive wt loss cases excluded. West Virginia AAS
SELENIUM; CADMIUM; ZINC; COPPER; AUTOPSIES; KIDNEYS; WEST VIRGINIA; HYPERTENSION; TRACE ELEMENTS Horvath, D.J.; Barker, F.W.; Thayne, W.V.; Frost, J.L. 1984 Biological Trace Element Research 6:225-236				

Tissue	Cases Exposure Route	Range	Mean	General Information
9153 Kidney	394 Inhalation	a) Not given b) Not given	a) 3.34+/-3.15 ug/g b) 2.04+/-0.87 ug/g	a) Smokers (8 or more cigarettes/day) b) Nonsmokers and those smoking 7 cigarettes or less/day Significantly different $p < .05$. 0-94 yr olds from 8 regional hospitals, Japan AAS
9154 Liver	394 Inhalation	a) Not given b) Not given	a) 8.11+/-12.2 ug/g b) 5.28+/-2.07 ug/g	a) Smokers (8 or more cigarettes/day) b) Nonsmokers and those smoking 7 cigarettes or less/day. 0-94 yr olds from 8 regional hospitals, Japan AAS
JAPAN; AUTOPSIES; HEART; KIDNEYS; LIVER; METALS; ZINC; POPULATION EXPOSURE; SMOKING; TOBACCOS; DELIBERATE EXPOSURE; COPPER; CADMIUM Iwao, S.; Tsuchiya, K.; Sugita, M. 1983 Archives of Environmental Health 38(3):156-162				

Copper

7440-50-8

Cu

AtW 63.546, MP 1083 C, BP 2595 C, VP 1 mm Hg at 1628 C, 10 mm Hg at 1870 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9185 Liver	86	a) 2.0-12.5 ug/g b) 3.52-9.01 ug/g c) -/<2.0-15.0 ug/g d) 1.7-9.9 ug/g	a) 5.16 ug/g b) 5.65 ug/g c) -/<6.51 ug/g d) 5.51 ug/g	a) 1 sample per liver (86), AAS b) 1 sample from 12 of 86 livers, IDMS c) 2 samples from 51 livers, 1 sample from 5, NA d) 1 sample from 24 of 86 livers, voltammetry Normal tissues from autopsies. Baltimore, MD, Minneapolis, MN; Seattle, WA AAS; NA

LIVER; ENVIRONMENTAL EXPOSURE; AUTOPSIES; COMPARATIVE EVALUATIONS; MEASUREMENT METHODS; ALUMINUM; CADMIUM; COPPER; LEAD; MANGANESE; SELENIUM; ZINC

Seisler, R.; Harrison, S.H.; Wise, S.A. 1984 Biological Trace Element Research 6:31-46

Tissue	Cases Exposure Route	Range	Mean	General Information
9186 Liver	86	a) 3.6-14.2 mg/kg b) 2.0-12.8 mg/kg	a) 6.93 +or- 2.64 mg/kg b) 6.45 +or- 2.31 mg/kg	a) Females b) Males Autopsies. Levels generally lower than those in other countries. No major regional variations. New Zealanders. Death by physical injuries AAS

LIVER; COMPARATIVE EVALUATIONS; ARSENIC; CADMIUM; CHROMIUM; COBALT; COPPER; NEW ZEALAND; AUTOPSIES; LEAD; MANGANESE; MERCURY; NICKEL; SELENIUM; SILVER; ZINC

Pickston, L.; Lewin, J.P.; Drysdale, J.M.; Smith, J.M.; Bruce, J. 1968 Journal of Analytical Toxicology 7:2-6

Tissue	Cases Exposure Route	Range	Mean	General Information
9187 Milk		a) Not given b) Not given c) Not given d) Not given e) Not given	a) 0.4 ug/ml b) 0.46 ug/ml c) 0.6 ug/ml d) 0.21 ug/ml e) 0.2 ug/ ml	a) Approximate values in Australia, UK, New Zealand b) Greece c) Finland d) Hungary e) Sweden Levels in Hungary, Sweden considered low. Levels from database containing data on "normal" levels of 15 elements in 7 tissues/fluids. Data selected by 60 investigators in over 40 countries. Diet, environment both important in distribution of elements.

ZINC; COPPER; MANGANESE; SELENIUM; LEAD; CADMIUM; BLOOD; BLOOD SERUM; HAIR; MILK; BANGLADESH; INDIA; TURKEY; FINLAND; ITALY; NEW ZEALAND; GUATEMALA; CHILE; SWEDEN; HUNGARY; YUGOSLAVIA; POLAND; KENYA; EGYPT; SOUTH AFRICA; UNITED STATES; AUSTRALIA; GREECE; PAKISTAN; NIGERIA; PHILIPPINES; ZAIRE; THAILAND; CHINA; WYOMING; OHIO; CALIFORNIA; JAPAN; MEXICO; CANADA; ISRAEL; PERU; SPAIN; COMPARATIVE EVALUATIONS; BIOLOGICAL MONITORING; IRAN; DIETS; ENVIRONMENTAL EXPOSURE

Iyengar, G.V. 1984 Science of the Total Environment 38:125-151

Copper
7440-50-8
Cu
AtW 63.546, MP 1083 C, BP 2595 C, VP 1 mm Hg at 1628 C, 10 mm Hg at 1870 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9158 Milk	a) 10 b) 17 c) 7	a) 1.4-3.5 mg/kg b) 0.9-4.8 mg/kg c) 0.17-3.6 mg/kg Dry wt	a) 2.3 +or- 0.6 mg/kg b) 2.7 +or- 1.2 mg/kg c) 1.9 +or- 1.15 mg/kg Dry wt	a) Colostrum (1st or 2nd day post partum) b) Transitional milk (3-8 days post partum) c) Mature milk (1-8 mo post partum) Slovenia, Yugoslavia NA

MILK; ARSENIC; CADMIUM; COBALT; COPPER; MERCURY; IODINE; MANGANESE; ANTIMONY; SELENIUM; VANADIUM; ZINC; YUGOSLAVIA; ENVIRONMENTAL EXPOSURE
Kosta, L.; Byrne, A.R.; Dermelj, M. 1983 Science of the Total Environment 29:261-268

Tissue	Cases Exposure Route	Range	Mean	General Information
9158 Placenta	281	0.22-1.54 ug/g Wet wt	0.77+/-0.20 ug/g Wet wt	118 cases Nagoya, Japan, 1974-1978. Normal deliveries. AAS

ZINC; MERCURY; METHYLMERCURY; LEAD; CADMIUM; MANGANESE; COPPER; IRON; JAPAN; BLOOD; PLACENTA; UMBILICAL CORD; METALS; ENVIRONMENTAL EXPOSURE
Tsuchiya, H.; Mitani, K.; Kodama, K.; Nakata, T. 1984 Archives of Environmental Health 39(1):11-17

Tissue	Cases Exposure Route	Range	Mean	General Information
9160 Placenta				Review. Discussion of relationship to specificity of fetal effects, follow-up, possible mechanisms of toxicity. Specimens from TX, CA, UT, NC, AL, GA, NY, NJ

PLACENTA; ALABAMA; BELGIUM; CALIFORNIA; GEORGIA; GERMANY; IOWA; JAPAN; MISSOURI; NEW JERSEY; NEW YORK; NORTH CAROLINA; OHIO; TENNESSEE; TEXAS; UNITED KINGDOM; UTAH; CADMIUM; COPPER; LEAD; MERCURY; MERCURY INORGANIC COMPOUNDS; MERCURY ORGANIC COMPOUNDS; ZINC; PREGNANCY; BEHAVIOR DISORDERS
Miller, R.K. 1984 American Journal of Industrial Medicine 4:205-244

Tissue	Cases Exposure Route	Range	Mean	General Information
9161 Umbilical cord	281	0.14-1.81 ug/g Wet wt	0.41+/-17 ug/g Wet wt	112 cases Nagoya, Japan, 1974-1978. Normal deliveries. AAS

ZINC; MERCURY; METHYLMERCURY; LEAD; CADMIUM; MANGANESE; COPPER; IRON; JAPAN; BLOOD; PLACENTA; UMBILICAL CORD; METALS; ENVIRONMENTAL EXPOSURE
Tsuchiya, H.; Mitani, K.; Kodama, K.; Nakata, T. 1984 Archives of Environmental Health 39(1):11-17

Copper
7440-50-8
Cu
AtW 63.546, MP 1083 C, BP 2595 C, VP 1 mm Hg at 1628 C, 10 mm Hg at 1870 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9162 Urine	24	0.1-0.5 umol/day	0.2+/-0.1 umol/day	Intake, men, 19.7 umol/day (range 12.2-36.7), women 20.5 umol/day (range 10.2-47.8). Intake 64% of lowe. limit (3.5 umol/day). Average retention, -0.8 umol/day, not significantly different from 0. No apparent health effects from deficiency. Healthy elderly (11 men, 73.3-85.2 yr (mean 78.2), 13 women 69.7-85.5 yr (mean 75.6)) and younger controls, Southampton, England AAS
BLOOD; BLOOD PLASMA; LEUKOCYTES; URINE; DELIBERATE EXPOSURE; UNITED KINGDOM; ADULTS; COPPER; ZINC; METALS Bunker, V.W.; Hinks, L.J.; Lawson, M.S.; Clayton, B.E. 1984 American Journal of Clinical Nutrition 40:1096-1102				

Tissue	Cases Exposure Route	Range	Mean	General Information
9163 Urine	9 Ingestion	a) Not given b) Not given c) Not given	a) 60+/-3 ug/day b) 64+/-3 ug/day c) 60+/-3 ug/day S.E.	a) Uncured b) Cured, 40 mg/kg nitrite c) Cured, 47 mg/kg nitrite + 200 mg/kg erythorbate 200 g/day cured or uncured sausage. 3 subjects/group, each set rotating to next group every 17 d. Pooled samples from day 6-16. Healthy, 21-27 yr old. Mean ht 180 cm, mean wt 78 kg AAS
BIOAVAILABILITY; IRON; ZINC; COPPER; DELIBERATE EXPOSURE; METABOLISM; URINE; BLOOD SERUM; UNITED STATES Greger, J.L.; Lee, K.; Graham, K.L.; Chinn, B.L.; Liebert, J.C. 1984 Journal of Agricultural and Food Chemistry 32:861-865				

Tissue	Cases Exposure Route	Range	Mean	General Information
9164 Urine	a) 31 b) 19 c) 21 d) 29	a) 8.5+/-1.6-22.4+/-1.3 ug/l b) 70.1+/-2.2-90.1+/-1.7 ug/l c) 84.5+/-1.4-102.8+/-1.6 ug/l d) 15.2+/-1.6-29.7+/-2.2 ug/l	a) Not given b) Not given c) Not given d) Not given	a) Controls, non-exposed b) Patients with Itai-itai disease - renal damage and bone lesions c) Patients suspected of having disease - renal damage, no obvious bone lesions d) Exposed - no bone or renal disorders Ranges of means. a)-d) environmentally exposed. b), c) and 5 in d) significantly different from a) 30-70 yr old women AAS
URINE; BLOOD SERUM; ENVIRONMENTAL EXPOSURE; JAPAN; COPPER; CADMIUM; ZINC; KIDNEY DISEASES Nogawa, K.; Yamada, Y.; Honda, R.; Tsuritani, I.; Kobayashi, E.; Ishizaki, M. 1984 Environmental Research 33:29-38				

Copper
7440-50-8
Cu
AtW 63.546, MP 1083 C, BP 2595 C, VP 1 mm Hg at 1628 C, 10 mm Hg at 1870 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9165 Urine	10 Injection	0.8-0.8 ug/hr	Not applicable	0-24 hr, peak (2.3 ug/hr) at 4 hr after 1-hr IV infusion of 20 mg EDTA/kg in 5% glucose. Range of means. Gun metal founders employed at factory 7-15 yr. Mean age 51 yr. AAS
URINE; BLOOD PLASMA; OCCUPATIONAL EXPOSURE; JAPAN; ADULTS; METAL POISONING; LEAD POISONING; COPPER; LEAD; ZINC; METALS; BIOACCUMULATION; INDUSTRIAL POLLUTION; BIOCONCENTRATION Aono, H.; Araki, S. 1984 International Archives of Occupational and Environmental Health 55:13-18				

Tissue	Cases Exposure Route	Range	Mean	General Information
9166 Urine	a) 232 b) 15 c) 22 d) 42 e) 10	a) Not given b) Not given c) Not given d) Not given e) not given	a) 221+/-215 ug/L b) 176+/-45 ug/L c) 175+/-37 ug/L d) 204+/-192 ug/L e) 195+/-31 ug/L	a) Controls, (from general unexposed population) b) Possibly exposed (professionals, administrators, etc.) c) Low-exposure (plant superintendent, supervisors, foremen, fingerlift operators) d) Moderate-exposure (equipment operators, laborors, drivers, maintenance workers, warehousemen) e) High-exposure (treating plant operators) Employees in wood treatment process. Exposures to chromated Cu arsenate preservatives. Wood treaters: mean 191 ug/l Controls: mean 221 ug/l. Hawaiians, Caucasians, Filipines, Japanese AAS
WOOD PRESERVATIVES; ARSENIC; CHROMIUM; COPPER; URINE; HAWAII; COMPARATIVE EVALUATIONS; RACIAL STUDIES; OCCUPATIONAL EXPOSURE; HEALTH HAZARDS; INHALATION; OCCUPATIONAL HAZARDS Takahashi, W.; Pfenninger, K.; Wong, L. 1983 Archives of Environmental Health 38(4):209-214				

Tissue	Cases Exposure Route	Range	Mean	General Information
9167 Urine	6	a) Not given b) Not given c) Not given d) Not given	a) 0.58 +or- 0.22 mg b) 0.39 +or- 0.08 mg c) 0.24 +or- 0.07 mg d) 0.36 +or- 0.06 mg	a) After overnight fast b) After standard breakfast c) After 300 mg ferrous sulfate d) After antacid mixture (1200 mg Mg-hydroxide, 1850 mg Al-hydroxide, 150 mg simethicone) Excretion during 24 hr. Doses: 500 mg Healthy 22-30 yr olds, wt 56-77 kg AAS
ADULTS; RHEUMATOID ARTHRITIS; BLOOD PLASMA; URINE; DRUGS; COMPARATIVE EVALUATIONS Osman, M.A.; Patel, R.B.; Schuna, A.; Sundstrom, W.R.; Welling, P.G. 1983 Clinical Pharmacology and Therapeutics 33(4):465-470				

Cotinine (8 CI); 2-Pyrrolidinone, 1-methyl-5-(3-pyridinyl-,(S)- (9 CI)
486-56-6
C10-H12-N2-O
MW 176.21, 210-211 C at 6 mm Hg

Tissue	Cases Exposure Route	Range	Mean	General Information
9168 Amniotic fluid	29 Inhalation	5-188 ng/ml	Not given	Smokers. 16-24 wk gestation.
AMNIOTIC FLUID; PLACENTA; BLOOD SERUM; MILK; URINE; DELIBERATE EXPOSURE; ENVIRONMENTAL EXPOSURE; ADULTS; INFANTS; NICOTINE; PREGNANCY; SMOKING; LACTATION; DRUGS Luck, W.; Nau, H. 1984 New England Journal of Medicine 311(10):672				

Tissue	Cases Exposure Route	Range	Mean	General Information
9169 Blood, plasma	a) 187 b) 181 Inhalation	a) 200-6000 nmol/l b) 0-750 nmol/l	a) 1905+/-1321 nmol/l b) 25+/-76 nmol/l	a) Smokers, 22.8+/-12.5 cigarettes/d b) Non-smokers Order of sensitivity in distinguishing groups: plasma, cotinine, blood carboxyhemoglobin, thiocyanate 187 smokers in voluntary smoking-reduction campaign. 181 non-smokers matched for age and sex. GC
BLOOD PLASMA; DELIBERATE EXPOSURE; AUSTRALIA; ADULTS; COMPARATIVE EVALUATIONS; HEMOGLOBINS; THIOCYANATES; NICOTINE; BIOACCUMULATION; BIOLOGICAL MONITORING; HEALTH HAZARDS; INHALATION; METABOLITES; SMOKING; TOBACCOS Pojer, R.; Whitfield, J.B.; Poulus, V.; Eckhart, I.P.; Richmond, R.; Hensley, W.J. 1984 Clinical Chemistry 30(8);1377-1380				

Tissue	Cases Exposure Route	Range	Mean	General Information
9170 Blood, plasma	6 Inhalation	47+/-7.2-69.1+/-9.8 ng/ml	Not applicable	0-72 min, steady rise to plateau levels for next 60 min. Healthy volunteers, 25-37 yr old, 3 males, 3 females, moderate (20-30 cigarettes daily) smokers GC
BLOOD PLASMA; URINE; DELIBERATE EXPOSURE; UNITED KINGDOM; ADULTS; STIMULANTS; HEMOGLOBINS; NICOTINE; THIOCYANATES; BIOACCUMULATION; BIOINDICATORS; HEALTH HAZARDS; INHALATION; METABOLISM; SMOKING; TOBACCOS; SALIVA; DRUGS Hopkins, R.; Wood, L.E.; Sinclair, N.M. 1984 Clinical Pharmacology and Therapeutics 36(6):788-795				

Tissue	Cases Exposure Route	Range	Mean	General Information
9171 Blood, serum	a) 27 b) 8 Inhalation Ingestion	a) 15-233 ng/ml b) 5-30 ng/ml	a) Not given b) Not given	a) Umbilical cord at birth b) 3-6 d old. Breast-fed Mothers smoked. No passive smoking.
9172 Milk	23 Inhalation	12-222 ng/ml	Not given	1 wk-3 mo lactation. Smokers.

(next page)

Cotinine (8 CI); 2-Pyrrolidinone, 1-methyl-5-(3-pyridinyl-,(S)- (9 CI)
486-56-6
C10-H12-N2-O
MW 176.21, 210-211 C at 6 mm Hg

(continued)

Tissue	Cases Exposure Route	Range	Mean	General Information
9175 Placenta	a) 3 b) 17 Inhalation	a) 40-100 ng/ml b) 10-131 ng/ml	a) Not given b) Not given	a) 10 wk gestation b) At birth Smokers.
AMNIOTIC FLUID; PLACENTA; BLOOD SERUM; MILK; URINE; DELIBERATE EXPOSURE; ENVIRONMENTAL EXPOSURE; ADULTS; INFANTS; NICOTINE; PREGNANCY; SMOKING; LACTATION; DRUGS Luck, W.; Nau, H. 1984 New England Journal of Medicine 311(10):672				

Tissue	Cases Exposure Route	Range	Mean	General Information
9174 Saliva	a) 18 b) 27 Inhalation	a) 0 b) 0-3 ng/ml	a) 0 b) 9 ng/ml Medians	a) No reported exposure to tobacco smoke within previous week b) At least 2 exposures in previous 24 hr. 4 infants had no measurable amount. Significant, direct dose-response relation to number of cigarettes smoked by mother. <1 yr olds, NC, excluded infants breast-fed by smokers RIA
SALIVA; URINE; ENVIRONMENTAL EXPOSURE; NORTH CAROLINA; INFANTS; COMPARATIVE EVALUATIONS; NICOTINE; SMOKING; METABOLITES; INHALATION; DRUGS Greenberg, R.A.; Haley, N.J.; Etzel, R.A.; Loda, F.A. 1984 New England Journal of Medicine 310(17):1075-1078				

Tissue	Cases Exposure Route	Range	Mean	General Information
9175 Urine	12 Ingestion	10-87 ng/ml	Not given	3-6 d olds, breastfed. Mothers smoked. No passive smoking. Levels also given in responding letter.
AMNIOTIC FLUID; PLACENTA; BLOOD SERUM; MILK; URINE; DELIBERATE EXPOSURE; ENVIRONMENTAL EXPOSURE; ADULTS; INFANTS; NICOTINE; PREGNANCY; SMOKING; LACTATION; DRUGS Luck, W.; Nau, H. 1984 New England Journal of Medicine 311(10):672				

Tissue	Cases Exposure Route	Range	Mean	General Information
9176 Urine	a) 18 b) 28 Inhalation	a) 0-125 ng b) 41-1885 ng /mg creatinine	a) 4 ng b) 351 ng /mg creatinine Medians	a) No reported exposure to tobacco smoke within previous week. 2 infants with 63 and 125 ng/mg might have had single unreported exposures b) At least 2 exposures in previous 24 hr. Significant, direct dose-response relation to number of cigarettes smoked by mother. More useful indicator than nicotine of chronic exposure in young. <1 yr olds, NC, excluded infants breast-fed by smokers RIA
SALIVA; URINE; ENVIRONMENTAL EXPOSURE; NORTH CAROLINA; INFANTS; COMPARATIVE EVALUATIONS; NICOTINE; SMOKING; METABOLITES; INHALATION; DRUGS Greenberg, R.A.; Haley, N.J.; Etzel, R.A.; Loda, F.A. 1984 New England Journal of Medicine 310(17):1075-1078				

Cotinine (8 CI); 2-Pyrrolidinone, 1-methyl-5-(3-pyridinyl-,(S)- (9 CI)
486-56-6
C10-H12-N2-O
MW 176.21, 310-311 C at 6 mm Hg

Tissue	Cases Exposure Route	Range	Mean	General Information
9177 Urine	6 Inhalation	a) Not given b) Not given	a) 0.51+/-0.07 ug/ml b) 0.29+/-0.04 ug/ml	a) Before smoking b) 24 hr after smoking 1 cigarette. Healthy volunteers, 25-37 yr old, 3 males, 3 females, moderate (20-30 cigarettes daily) smokers GC
BLOOD PLASMA; URINE; DELIBERATE EXPOSURE; UNITED KINGDOM; ADULTS; STIMULANTS; HEMOGLOBINS; NICOTINE; THIOCYANATES; BIOACCUMULATION; BIOINDICATORS; HEALTH HAZARDS; INHALATION; METABOLISM; SMOKING; TOBACCOS; SALIVA; DRUGS Hopkins, R.; Wood, L.E.; Sinclair, N.M. 1984 Clinical Pharmacology and Therapeutics 36(6):788-795				

Tissue	Cases Exposure Route	Range	Mean	General Information
9178 Urine	a) 101 b) 20 Inhalation	a) Not given b) Not given	a) 8.5+/-1.3 ng/ml b) 25.2+/-14.8 ng/ml S.E.	a) Non-smokers, married to non-smokers, exposed to smoke 11.0+/-1.2 hr/wk b) Non-smokers married to smokers, exposed to smoke 23.2+/-4.1 hr/wk Significant difference $p < 0.05$.
URINE; ENVIRONMENTAL EXPOSURE; UNITED KINGDOM; ADULTS; SMOKING; INHALATION Wald, N.; Ritchie, C. 1984 Lancet 1 (8385):1067				

Tissue	Cases Exposure Route	Range	Mean	General Information
9179 Urine	763 Inhalation	a) Not given b) 0.31+/-0.08-1.56+/-0.57 ug c) 6.9-10.5 ug d) Not given e) 0.24+/-0.05-0.98+/-0.23 ug f) Not given g) Not given /mg creatinine	a) 0.51+/-0.09 ug b) 0.79+/-0.10 ug c) 8.57+/-0.39 ug d) 0.22+/-0.07 ug e) 0.72+/-0.10 ug f) 0.12 ug g) 1.45 ug /mg creatinine	a) 200 nonsmokers, no smokers in home b) 272 nonsmokers, smokers in home c) 291 smokers d) 76 nonsmokers, no smokers in workplace e) 201 nonsmokers, 1->6 smokers in workplace f) 38 nonsmokers, no smokers in home or workplace g) 10 nonsmokers, smokers in home (>20 cigarettes/d) & smokers in workplace (>6 cigarettes/d) Significant differences: d) from e) and f) from g), $p < 0.05$. Some values estimated from graph. Data also comparing nonsmokers living in rural and urban areas. 472 nonsmokers (42.0+/-18.0 yr old men and 45.7+/-25.9 yr old women) and 291 smokers (42.7+/-15.0 yr old men and 52.5+/-15.6 yr old women), Japan RIA
URINE; DELIBERATE EXPOSURE; ENVIRONMENTAL EXPOSURE; JAPAN; ADULTS; SMOKING; INHALATION Matsukura, S.; Taminato, T.; Kitano, N.; Seino, Y.; Hamada, H.; Uchihashi, M.; Nakajima, H.; Hirata, Y. 1984 New England Journal of Medicine 311(13):828-832				

Creatine (8 CI); Glycine, N-(aminoiminomethyl)-N-methyl- (9 CI)
57-00-1
C4-H9-N3-O2
MW 131.14

Tissue	Cases Exposure Route	Range	Mean	General Information
9180 Blood, plasma	100	a) Not given b) Not given	a) 0.10+/-0.03 mmol/l b) 0.04+/-0.001 mmol/l	a) 50 patients with uremia b) 50 normal controls Enzymatic
9181 Urine	100	a) Not given b) Not given	a) 3.56+/-0.2 mmol/l b) 0.24+/-0.006 mmol/l	a) 50 patients with ducenne muscular dystrophy b) 50 normal controls Enzymatic
URINE; BLOOD PLASMA; MUSCLES; ITALY; KIDNEY DISEASES; NEUROMUSCULAR DISEASES; AMINO ACIDS; BIOINDICATORS; BIOLOGICAL MONITORING; METABOLISM; METABOLITES Mussini, E.; Colombo, L.; De Ponte, G.; Marcucci, F. 1984 Journal of Chromatography 305:450-455				

Creatinine (8 CI); 4H-Imidazol-4-one, 2-amino-1,5-dihydro-1-methyl- (9 CI)
60-27-5
C4-H7-N3-O
MW 113.12

Tissue	Cases Exposure Route	Range	Mean	General Information
9182 Blood, plasma	100	a) Not given b) Not given	a) 0.74+/-0.02 mmol/l b) 0.09+/-0.001 mmol/l	a) 50 patients with uremia b) 50 normal controls Enzymatic
9183 Urine	100	a) Not given b) Not given	a) 3.30+/-0.2 mmol/l b) 6.50+/-0.5 mmol/l	a) 50 patients with duchenne muscular dystrophy b) 50 normal controls Enzymatic
URINE; BLOOD PLASMA; MUSCLES; ITALY; KIDNEY DISEASES; NEUROMUSCULAR DISEASES; AMINO ACIDS; BIOINDICATORS; BIOLOGICAL MONITORING; METABOLISM; METABOLITES Mussini, E.; Colombo, L.; De Ponte, G.; Marcucci, F. 1984 Journal of Chromatography 305:450-455				

Cyclohexane, 1,2,3,4,5,6-hexachloro-, alpha- (8 CI); Cyclohexane, 1,2,3,4,5,6-hexachloro-, (1alpha,2alpha,3beta,4alpha,5beta,6beta)- (9 CI)
319-84-6
C6-H6-Cl6
MW 290.83, MP 159.5-160 C, BP 288 C, VP 0.02 mm Hg at 20 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9184 Blood, serum	93	a) Not given b) Not given c) Not given d) Not given e) Not given f) Not given	a) 2.2+/-4.4 ug/l b) 3.0+/-4.4 ug/l c) 1.9+/-2.5 ug/l d) 2.7+/-3.5 ug/l e) 1.4+/-3.5 ug/l f) 1.9+/-5.2 ug/l	a) Mothers, Zagreb, 16 positive samples b) Children, Zagreb, 21 positive samples c) Mothers, Titov Veles, 14 positive samples d) Children, Titov Veles, 20 positive samples e) Mothers, Pula, 9 positive samples f) Children, Pula, 9 positive samples. Mothers, newborns, during 1978-81. 1-3 days postpartum. U. of Zagreb, Medical Center Jitov Veles, Medical Center Pula, Yugoslavia GC

ENVIRONMENTAL EXPOSURE; PESTICIDES; BLOOD SERUM; YUGOSLAVIA; NEWBORN; INFANTS; CHLORINE; ORGANIC COMPOUNDS; DDD; DDE; DDT; HEXACHLOROCYCLOHEXANE; PESTICIDE RESIDUES; LINDANE; POPULATION EXPOSURE; PREGNANCY

Basulic, D.; Stampar-Plasaj, B.; Bujanovic, V.; Stojanovski, N.; Nastev, B.; Rudelic, I.; Sisul, N.; Zusek, A. 1984 Bulletin of Environmental Contamination and Toxicology 32:265-268

Tissue	Cases Exposure Route	Range	Mean	General Information
9185 Milk	a) 54 b) 102	a) Not detected-0.78 ppm b) Not detected-0.85 ppm	a) 0.10 +or- 0.23 ppm b) 0.10 +or- 0.18 ppm	a) Hawaii b) Mainland USA Sampled up to 1 mo postpartum. Lipid basis. Mean of positive residues. 1979-80 GC

HAWAII; UNITED STATES; ADULTS; MILK; ALDRIN; CHLORINATED HYDROCARBONS; CHLORINE ORGANIC COMPOUNDS; DDD; DDE; DDT; DIELDRIN; HEPTACHLOR EPOXIDE; HEPTACHLOROCYCLOHEXANE; HEXACHLOROBENZENE; LINDANE; NONACHLOR; OXYCHLORDANE; POLYCHLORINATED BIPHENYLS; PESTICIDE RESIDUES; POPULATION EXPOSURE; ENVIRONMENTAL EXPOSURE

Takei, G.H.; Kaushikaua, S.M.; Leong, G.H. 1983 Bulletin of Environmental Contamination and Toxicology 30:606-613

Tissue	Cases Exposure Route	Range	Mean	General Information
9186 Milk	a) 20 b) 20 c) 20 d) 20 e) 20	a) 0.004-0.010 mg b) 0.003-0.013 mg c) 0.004-0.014 mg d) 0.002-0.011 mg e) 0.008-0.017 mg /kg fat	a) 0.006+/-0.003 mg b) 0.006+/-0.003 mg c) 0.007+/-0.003 mg d) 0.006+/-0.003 mg e) 0.011+/-0.002 mg /kg fat	a) Umea, north coast b) Osterund, middle c) Stockholm, east coast d) Gothenburg, west coast e) Lund, south Range of 15 samples from mothers in each area. Samples pooled, milk collected 3-5 days postpartum. 1977-79, Sweden GC-EC

SWEDEN; MILK; DDE; DDT; DIELDRIN ; HEXACHLOROCYCLOHEXANE; HEXACHLOROBENZENE; POLYCHLORINATED BIPHENYLS; AGRICULTURE; INDUSTRIAL AREAS; LACTATION; PESTICIDE RESIDUES; POPULATION EXPOSURE; ENVIRONMENTAL EXPOSURE

Noren, K. 1983 Ambio 12(1):44-46

Cyclohexane, 1,2,3,4,5,6-hexachloro-, beta- (8 CI); Cyclohexane, 1,2,3,4,5,6-hexachloro-, (1alpha,2beta,3alpha,4beta,5alpha,6beta)- (9 CI)
319-85-7
C6-H6-Cl6
MW 290.83, MP 314-315 C (sublimes), BP 60 C at 0.58 mm Hg, VP 0.005 mm Hg at 20 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9187 Adipose	a) 91 b) 84	a) Not detected-3430 ng/g b) 10-680 ng/g	a) 136+/-474 ng/g b) 45+/-85 ng/g	a) Kingston b) Ottawa Single samples from greater omentum of each cadaver. Significantly different. In general, residue values in entire survey of 20 compounds slightly higher in Kingston. No significant differences by sex Autopsies, unembalmed cadavers, 11/79-1/81, Kingston, Ontario (a Great Lakes Community) and 11/80-1/81, Ottawa, Ontario (outside Great Lakes Basin), Canada. Age ranges 7-88 yr, 16-91 yr, respectively. GC/MS

ADIPOSE TISSUE; CANADA; AUTOPSIES; PESTICIDES; ENVIRONMENTAL EXPOSURE; CHLORINE ORGANIC COMPOUNDS; CHLOROBENZENES; WATER POLLUTION
Williams, D.T.; LeBel, G.L.; Junkins, E. 1984 Journal of Toxicology and Environmental Health 13:19-29

Tissue	Cases Exposure Route	Range	Mean	General Information
9188 Milk	16	a) Not given b) Not given c) Not given d) Not given e) Not given f) Not given g) Not given h) Not given	a) 4.1 ng b) 5.6 ng c) 5.2 ng d) 4.6 ng e) 3.6ng f) 3.2 ng g) 3.7 ng h) 3.3 ng /g whole blood	a) 7 d after parturition b) 14 d c) 28 d d) 42 d e) 56 d f) 70 d g) 84 d h) 98 d Average of samples collected at each time period. No correlation between levels in milk and blood. Accumulation of residue in infant body fat theoretically estimated to increase rapidly during 1st 3 mo of breastfeeding, eventually equal to or greater than adult levels Mothers, mean age 35+/-2 yr, mean wt 128+/-8 lb, National Capital Region, (Ottawa), Canada GC

BLOOD; MILK; ENVIRONMENTAL EXPOSURE; CANADA; ADULTS; PESTICIDES; POLYCHLORINATED BIPHENYLS; CHLORINE ORGANIC COMPOUNDS; LACTATION; PESTICIDE RESIDUES; DIELDRIN; DDT; DDE; OXYCHLORDANE; NONACHLOR; HEPTACHLOR EPOXIDE; HEXACHLOROBENZENE; BIOACCUMULATION
Mes, J.; Doyle, J.A.; Adams, B.R.; Davies, D.J.; Turton, D. 1984 Archives of Environmental Contamination and Toxicology 13:217-223

Cyclohexane, 1,2,3,4,5,6-hexachloro-, beta- (8 CI); Cyclohexane, 1,2,3,4,5,6-hexachloro-, (1alpha,2beta,3alpha,4beta,5alpha,6beta)- (9 CI)
319-85-7
C6-H6-Cl6
MW 290.83, MP 314-315 C (sublimes), BP 60 C at 0.66 mm Hg, VP 0.005 mm Hg at 20 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9180 Milk	a) 20 b) 20 c) 20 d) 20 e) 20	a) 0.079-0.18 mg b) 0.068-0.11 mg c) 0.11-0.25 mg d) 0.094-0.16 mg e) 0.14-0.22 mg /kg fat	a) 0.12+/-0.026 mg b) 0.078+/-0.014 mg c) 0.16+/-0.036 mg d) 0.12+/-0.021 mg e) 0.17+/-0.022 mg /kg fat	a) Umea, north coast b) Osterund, middle c) Stockholm, east coast d) Gothenburg, west coast e) Lund, south Range of 15 samples from mothers in each area. Samples pooled, milk collected 3-5 days postpartum. Levels in Stockholm, Lund significantly different (p=0.01) from Gothenbrug, Umea, Osterund. 1977-79, Sweden GC-EC

SWEDEN; MILK; DDE; DDT; DIELDRIN ; HEXACHLOROCYCLOHEXANE; HEXACHLOROBENZENE; POLYCHLORINATED BIPHENYLS; AGRICULTURE; INDUSTRIAL AREAS; LACTATION; PESTICIDE RESIDUES; POPULATION EXPOSURE; ENVIRONMENTAL EXPOSURE
Noren, K. 1983 Ambio 12(1):44-46

Tissue	Cases Exposure Route	Range	Mean	General Information
9180 Milk	a) 54 b) 102	a) Not detected-2.6 ppm b) Not detected-0.47 ppm	a) 0.080+/-0.075 ppm b) 0.006+/-0.060 ppm	a) Hawaii b) Mainland USA Sampled up to 1 mo postpartum. Lipid basis. Mean of positive residues. 1979-80 GC

HAWAII; UNITED STATES; ADULTS; MILK; ALDRIN; CHLORINATED HYDROCARBONS; CHLORINE ORGANIC COMPOUNDS; DDD; DDE; DDT; DIELDRIN; HEPTACHLOR EPOXIDE; HEPTACHLOROCYCLOHEXANE; HEXACHLOROBENZENE; LINDANE; NONACHLOR; OXYCHLORDANE; POLYCHLORINATED BIPHENYLS; PESTICIDE RESIDUES; POPULATION EXPOSURE; ENVIRONMENTAL EXPOSURE
Takei, G.H.; Kauahikaua, S.M.; Leong, G.H. 1983 Bulletin of Environmental Contamination and Toxicology 30:606-613

Tissue	Cases Exposure Route	Range	Mean	General Information
9191 Milk, fat	a) 57 b) 4	a) 0.02-0.28 mg/kg fat b) 0.10-0.26 mg/kg fat	a) 0.08 mg/kg fat b) 0.19 mg/kg fat	a) Samples from Copenhagen (10), Naestved (8), Odense (11), Bornholm (10), Sonderborg (8), Aalborg (10). Foremilk and hindmilk collected May-Dec 1982, 4-113 days postpartum b) Pools of equal parts from 9 mothers, Copenhagen, Feb 1982 Levels declined with number of parturitions, were higher in pooled than in individual samples. No immediate health risk to infants. Mothers with normal, healthy babies, 10 with low wt babies, Denmark GC-EC

MILK; ENVIRONMENTAL EXPOSURE; DENMARK; COMPARATIVE EVALUATIONS; CHLORINATED HYDROCARBONS; CHLORINE ORGANIC COMPOUNDS; CHLOROBENZENES; DDE; DDT; DIELDRIN; HEXACHLOROCYCLOHEXANE; HEXACHLOROBENZENE; POLYCHLORINATED BIPHENYLS
Andersen, J.R.; Orbaek, K. 1984 Ambio 13(4):266-268

Cyclohexane, 1,2,3,4,5,6-hexachloro-, gamma- (8 CI); Cyclohexane, 1,2,3,4,5,6-hexachloro-, (1alpha,2alpha,3beta,4alpha,5alpha,6beta)- (9 CI)
58-89-9
C6-H6-Cl6
MW 290.85, MP gamma-isomer crystals 112.5 C, BP 323.4 C, 176.2 C at 10 mm Hg, VP 0.14 mm Hg at 40 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9192 Blood, serum	93	a) Not given b) Not given c) Not given d) Not given e) Not given f) Not given	a) 3.7+/-2.9 ug/l b) 6.9+/-8.0 ug/l c) 3.7+/-4.9 ug/l d) 6.9+/-9.6 ug/l e) 1.7+/-3.2 ug/l f) 2.6+/-4.9 ug/l	1) Mothers, Zagreb, 25 positive samples b) Children, Zagreb, 26 positive samples c) Mothers, Titov Veles, 16 positive samples d) Children, Titov Veles, 28 positive samples e) Mothers, Pula, 15 positive samples f) Children, Pula, 12 positive samples Significant differences: f) and b) ($P<0.01$), f) and d) ($P<0.05$). Mothers, newborns, during 1978-81. 1-2 days postpartum. U. of Zagreb, Medical Center Jitov Veles, Medical Center Pula, Yugoslavia GC
ENVIRONMENTAL EXPOSURE; PESTICIDES; BLOOD SERUM; YUGOSLAVIA; NEWBORN; INFANTS; CHLORINE; ORGANIC COMPOUNDS; DDD; DDE; DDT; HEXACHLOROCYCLOHEXANE; PESTICIDE RESIDUES; LINDANE; POPULATION EXPOSURE; PREGNANCY Bazulic, D.; Stampar-Plasaj, B.; Bujanovic, V.; Stojanovski, N.; Nastev, B.; Rudelic, I.; Sisul, N.; Zuzek, A. 1984 Bulletin of Environmental Contamination and Toxicology 32:265-268				

Tissue	Cases Exposure Route	Range	Mean	General Information
9193 Milk				Review. Levels after occupational exposures to trace metals, solvents, and halogenated hydrocarbons, discussed in terms of milk partition factors, potential infant exposures, possible health effects.
MILK; ENVIRONMENTAL EXPOSURE; ADULTS; REVIEW; MERCURY; LEAD; DDT; DIELDRIN; POLYCHLORINATED BIPHENYLS; POLYBROMINATED BIPHENYLS; CHROMIUM; CADMIUM; HEPTACHLOR EPOXIDE; OXYCHLORDANE; BIOACCUMULATION; LACTATION; HEALTH HAZARDS Wolff, M.S. 1983 American Journal of Industrial Medicine 4:259-281				

Tissue	Cases Exposure Route	Range	Mean	General Information
9194 Milk, fat	57	0.01-0.03 mg/kg fat	Not given	Samples from Copenhagen (10), Naestved (8), Odense (11), Bornholm (10), Sonderborg (8), Aalborg (10). Foremilk and hindmilk collected May-Dec 1982, 6-113 days postpartum. Detected in 6 of 57 samples. Mothers with normal, healthy babies, 10 with low wt babies, Denmark GC-EC
MILK; ENVIRONMENTAL EXPOSURE; DENMARK; COMPARATIVE EVALUATIONS; CHLORINATED HYDROCARBONS; CHLORINE ORGANIC COMPOUNDS; CHLOROBENZENES; DDE; DDT; DIELDRIN; HEXACHLOROCYCLOHEXANE; HEXACHLOROBENZENE; POLYCHLORINATED BIPHENYLS Andersen, J.R.; Orback, K. 1984 Ambio 13(4):266-268				

Cyclopenta(c)furo(3',2':4,5)furo(2,3-h)(1)benzopyran-1,11-dione, 2,3,6aalpha,9aalpha-tetrahydro-4-methoxy- (8 CI) Cyclopenta(c)furo(3',2':4,5)furo(2,3-h)(1)benzopyran-1,11-dione, 2,3,6a,9a-tetrahydro-4-methoxy-, (6aR-cis)- (9 CI)
1162-65-8
C17-H12-O6
MW 312.3, MP 268 269 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9106 Blood, serum	a) 20 b) 80	a) 20-86 pg/ml b) 20-1160 pg/ml	a) 33.6+/-14.6 pg/ml b) 218.1+/-268.3 pg/ml	a) Detected in 5 of 20 fasting blood samples b) Detected in 29 of 80 samples taken after lunch Levels considered low in all but 4 samples with >500 pg/ml Healthy 20-65 yr old Japanese males. Osaka and Kobe. RIA; HPLC
AFLATOXINS; BLOOD SERUM; JAPAN; MEASUREMENT METHODS; CARCINOGEN; ENVIRONMENTAL EXPOSURE Tsubei, S.; Nakagawa, T.; Tomita, M.; Seo, T.; Ono, H.; Kawamura, K.; Iwamura, N. 1984 Cancer Research 44:1281-1284				

Cyclopropanecarboxylic acid, 3-(2,2-dichloroethenyl)-2,2-dimethyl-, cyano(3-phenoxyphenyl)methyl ester
52315-07-8
C22-H19-Cl2-N-O3
MW 416.3, MP 60 C, VP 3.3X10(E-8) mm Hg at 70 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9106 Urine	4 Ingestion	a) 40-62% b) 66-88%	a) 49% b) 78%	a) Metabolite, cis-methyl ester of cyclopropanecarboxylic acid b) Metabolite, trans-isomer Single dose 0.25-1.5 mg 1:1 cis/trans mixture. % excreted 24 hr Males HPLC; GC; GC-MS
URINE; DELIBERATE EXPOSURE; COMPARATIVE EVALUATIONS; MEASUREMENT METHODS; INSECTICIDES; METABOLITES; METABOLISM Bedford, C.V.; Baldwin, M.K. 1988 Xenobiotica 18(2):67-72				

DDT, total (No postings in CHEMLINE).
C14-H9-Cl5
MW 354.50

Tissue	Cases Exposure Route	Range	Mean	General Information
9197 Adipose	105 Ingestion	a) Not given b) Not given c) Not given d) Not given e) Not given f) Not given g) Not given h) Not given i) Not given j) Not given	a) 0.36+/-0.25 mg/kg b) 0.31+/-0.18 mg/kg c) 0.50+/-0.23 mg/kg d) 0.39+/-0.16 mg/kg e) 0.04+/-0.00 mg/kg f) 0.16+/-0.09 mg/kg g) 0.21+/-0.10 mg/kg h) 0.29+/-0.19 mg/kg i) 0.50+/-0.18 mg/kg j) 0.29+/-0.16 mg/kg	a) Men, whole country b) Women, whole country c) Men, South Finland d) Women, South Finland e) Men, <=1 fish meal/mo f) Women <=1 fish meal/mo g) Men, 2-3 fish meals/mo h) Women, 2-3 fish meals/mo i) Men, >=4 fish meals/mo j) Women, >=4 fish meals/mo. Hospital patients and accidental fatalities, 2 mo-91 yr old GC/MS

ADIPOSE TISSUE; ENVIRONMENTAL EXPOSURE; FINLAND; SEX; AGE; AUTOPSIES; BIOPSIES; CHLORINATED HYDROCARBONS; HEPTACHLOR EPOXIDE; HEXACHLOROBENZENE; DOT; POLYCHLORINATED BIPHENYLS; BIOACCUMULATION; BIOLOGICAL MONITORING; DIETS; FISHES; FOOD CONTAMINATION; HEALTH HAZARDS; POPULATION EXPOSURE
Mussalo-Rauhamaa, H.; Pyysalo, H.; Mollanen, R. 1984 Journal of Toxicology and Environmental Health 13:689-704

Tissue	Cases Exposure Route	Range	Mean	General Information
9198 Adipose	a) 48 b) 45 c) 92	a) Not given b) Not given c) Not given	a) 7.49 ppm b) 4.46 ppm c) 3.84 ppm	a) 1974 b) 1976 c) 1981 Levels higher in 40-60 yr olds than in 30 yr olds. Men higher than women. Use of organochlorine pesticides restricted for about 10 yr. 30->60 yr olds, Matsuyama City, Japan GC-EC

JAPAN; ADIPOSE TISSUE; ENVIRONMENTAL EXPOSURE; CHLORINE ORGANIC COMPOUNDS; DDT; HEPTACHLOROCYCLOHEXANE; HEXACHLOROBENZENE; POLYCHLORINATED BIPHENYLS; PESTICIDE RESIDUES; POPULATION EXPOSURE
Mori, Y.; Kikuta, M.; Okinaga, E.; Okura, T. 1985 Bulletin of Environmental Contamination and Toxicology 30:74-79

Tissue	Cases Exposure Route	Range	Mean	General Information
9199 Blood, serum	98	a) Not given b) Not given c) Not given d) Not given e) Not given f) Not given	a) 671.7 ug/l b) 452.2 ug/l c) 2107.7 ug/l d) 1438.6 ug/l e) 554.3 ug/l f) 1491.2 ug/l	a) Mothers, Zagreb b) Children, Zagreb c) Mothers, Titov Veles d) Children, Titov Veles e) Mothers, Pula f) Children, Pula Total DDT=p,p'-DDT+o,p'-DDT+1.114 (p,p'=DDE+p,p'-DDD). Mothers, newborns, during 1978-81. 1-2 days postpartum. U. of Zagreb, Medical Center Jitov Veles, Medical Center Pula, Yugoslavia GC

ENVIRONMENTAL EXPOSURE; PESTICIDES; BLOOD SERUM; YUGOSLAVIA; NEWBORN; INFANTS; CHLORINE; ORGANIC COMPOUNDS; DDD; DDE; DDT; HEXACHLOROCYCLOHEXANE; PESTICIDE RESIDUES; LINDANE; POPULATION EXPOSURE; PREGNANCY
Basulic, D.; Stampar-Plasaj, B.; Bujanovic, V.; Stojanovski, N.; Nastev, B.; Rudelic, I.; Sicul, N.; Zusek, A. 1984 Bulletin of Environmental Contamination and Toxicology 32:265-268

DDT, total (No postings in CHEMLINE).
C14-H9-Cl5
MW 354.50

Tissue	Cases Exposure Route	Range	Mean	General Information
9200 Milk				Review. Levels after occupational exposures to trace metals, solvents, and halogenated hydrocarbons, discussed in terms of milk partition factors, potential infant exposures, possible health effects.
MILK; ENVIRONMENTAL EXPOSURE; ADULTS; REVIEW; MERCURY; LEAD; DDT; DIELDRIN; POLYCHLORINATED BIPHENYLS; POLYBROMINATED BIPHENYLS; CHROMIUM; CADMIUM; HEPTACHLOR EPOXIDE; OXYCHLORDANE; BIOACCUMULATION; LACTATION; HEALTH HAZARDS Wolff, M.S. 1988 American Journal of Industrial Medicine 4:259-281				

Tissue	Cases Exposure Route	Range	Mean	General Information
9201 Milk				Review. Chemicals found in occupational exposures are discussed in terms of milk partition factors, potential infant exposures and possible infant health effects.
LEAD; MERCURY; PESTICIDES; POLYCHLORINATED BIPHENYLS; OCCUPATIONAL HAZARDS; MILK; COMPARATIVE EVALUATIONS; REVIEW; CADMIUM; CHROMIUM; DDT; DIELDRIN; INFANTS Wolff, M.S. 1988 American Journal of Industrial Medicine 4:259-281				

Tissue	Cases Exposure Route	Range	Mean	General Information
9202 Milk	a) 54 b) 102	a) 0.032-0.52 ppm b) Not detected-1.7 ppm	a) 0.16+/-0.096 ppm b) 0.19+/-0.20 ppm	a) Hawaii b) Mainland USA Sampled up to 1 mo postpartum. Lipid basis. Mean of positive residues. 1979-80 GC
HAWAII; UNITED STATES; ADULTS; MILK; ALDRIN; CHLORINATED HYDROCARBONS; CHLORINE ORGANIC COMPOUNDS; DDD; DDE; DDT; DIELDRIN; HEPTACHLOR EPOXIDE; HEPTACHLOROCYCLOHEXANE; HEXACHLOROBENZENE; LINDANE; NONACHLOR; OXYCHLORDANE; POLYCHLORINATED BIPHENYLS; PESTICIDE RESIDUES; POPULATION EXPOSURE; ENVIRONMENTAL EXPOSURE Takei, G.H.; Kauahikaua, S.M.; Leong, G.H. 1983 Bulletin of Environmental Contamination and Toxicology 30:606-613				

DDT, total (No postings in CHEMLINE).
C14-H9-Cl5
MW 354.50

Tissue	Cases Exposure Route	Range	Mean	General Information
9208 Milk	a) 20 b) 20 c) 20 d) 20 e) 20	a) 0.25-0.46 mg b) 0.19-0.41 mg c) 0.27-0.46 mg d) 0.21-0.39 mg e) 0.21-0.33 mg /kg fat	a) 0.30+/-0.06 mg b) 0.27+/-0.05 mg c) 0.35+/-0.06 mg d) 0.31+/-0.06 mg e) 0.26+/-0.04 mg /kg fat	a) Umea, north coast b) Ostersund, middle c) Stockholm, east coast d) Gothenburg, west coast e) Lund, south Range of 15 samples from mothers in each area. Samples pooled, milk collected 3-5 days postpartum. Levels p,p'-DDT + p,p'-DDE in Stockholm, Lund significantly different (p=0.05) from Umea, Ostersund. 1977-79, Sweden GC-EC

SWEDEN; MILK; DDE; DDT; DIELDRIN ; HEXACHLOROCYCLOHEXANE; HEXACHLOROBENZENE; POLYCHLORINATED BIPHENYLS; AGRICULTURE; INDUSTRIAL AREAS; LACTATION; PESTICIDE RESIDUES; POPULATION EXPOSURE; ENVIRONMENTAL EXPOSURE
Noren, K. 1983 Ambio 12(1):44-46

Tissue	Cases Exposure Route	Range	Mean	General Information
9204 Milk	8	a) 0.19-0.20 mg/kg b) 0.096-0.13 mg/kg c) 0.16-0.17 mg/kg d) 0.14-0.16 mg/kg	a) 0.19+/-0.005 mg/kg b) 0.12+/-0.007 mg/kg c) 0.165+/-0.005 mg/kg d) Not given	a) Successive fractions, 1 nursing period, mother A b) Successive fractions, 1 nursing period, mother B c) Each nursing period for 24 hr, mother C d) Sample 1X/wk, 4 wk, mother C Fat basis GC

ADULTS; MILK; MEASUREMENT METHODS; PESTICIDES; POLYCHLORINATED BIPHENYLS; LACTATION; HEALTH HAZARDS; ENVIRONMENTAL EXPOSURE
Noren, K. 1983 Archives of Environmental Contamination and Toxicology 12:277-283

Tissue	Cases Exposure Route	Range	Mean	General Information
9205 Milk	50	a) <0.0001-0.0033 mg/kg b) <0.003-0.10 mg/kg	a) 0.0012+/-0.0010 mg/kg b) 0.036+/-0.026 mg/kg	a) Milk b) Milk fat (mean of 3.7%) Nonsmokers, 22-38 yr old, ht 152-180 cm, wt 48-90 kg, 1-4 children, Finland. GC/MS

PESTICIDES; ADULTS; MILK; MEASUREMENT METHODS; FINLAND; DDT; DDE; DDD; HEXACHLOROBENZENE; OXYCHLORDANE; POLYCHLORINATED BIPHENYLS; POPULATION EXPOSURE; FOOD CONTAMINATION; WATER POLLUTION; NONACHLOR; ENVIRONMENTAL EXPOSURE
Wickstrom, K.; Pyysalo, H.; Simes, M.S. 1983 Bulletin of Environmental Contamination and Toxicology 31:251-256

Dibenzo-p-dioxin, 2,3,7,8-tetrachloro- (8 Cl); Dibenzo(b,e)(1,4)dioxin, 2,3,7,8-tetrachloro- (9 Cl)
1746-01-6
C12-H4-Cl4-O2
MW 322, MP 305 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9206 Adipose	a) 8 b) 6 c) 12 d) 10 e) 8	a) Not detected-90 ppt b) Not detected-8 ppt c) Not detected-13 ppt d) Not detected-14 ppt e) 4-6 ppt	a) Not given b) Not given c) Not given d) Not given e) Not given	a) Heavily exposed. Range of 20-178 ppt by capillary column GC/MS (CCGC/MS) b) Lightly exposed. Range of ND-16 ppt in 5 samples retested by CCGC/MS c) Possibly exposed. Range of ND-5 ppt in 2 samples retested by CCGC/MS d) Controls. Range of ND-20 ppt in 5 samples retested by CCGC/MS e) USAF researchers. Range of 10-24 ppt in 2 samples retested by CCGC/MS. All military: Vietnam veterans, controls with no Vietnam service GC/MS
ADIPOSE TISSUE; BIOPSIES; COMPARATIVE EVALUATIONS; MEASUREMENT METHODS; ENVIRONMENTAL EXPOSURE; PESTICIDES Gross, M.L.; Lay, J.O., Jr.; Lyon, P.A.; Lippstreu, D.; Kangas, N.; Harless, R.L.; Taylor, S.E.; Dupey, A.E., Jr. 1984 Environmental Research 33:261-268				

Diethylamine, N-nitroso- (5 Cl); Ethanamine, N-ethyl-N-nitroso- (9 Cl)
55-18-5
C4-H10-N2-O
MW 102.14, BP 175-177 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9207 Blood	a) 4 b) 9 c) 10 Ingestion	a) Not detected-0.4 ug/l b) Not detected-0.8 ug/l c) Not detected-0.8 ug/l	a) Not given b) Not given c) Not given	a) Lab workers handling nitrosamines b) Other lab workers c) Non-lab workers After meal, no fish, cured meat, fruit (excludes ascorbic acid) 26-50 yr old nonsmokers GC/MS
ADULTS; UNITED KINGDOM; BLOOD; COMPARATIVE EVALUATIONS; FOODS; MEAT; VEGETABLES; DIETS; ENVIRONMENTAL EXPOSURE; DELIBERATE EXPOSURE; OCCUPATIONAL EXPOSURE Gough, T.A.; Webb, K.S.; Swann, P.F. 1985 Food and Chemical Toxicology 21(2):151-156				

Tissue	Cases Exposure Route	Range	Mean	General Information
9208 Saliva	8 Ingestion	2-20 ng/ml	14.5 ng/ml	Tobacco chewers. Compounds from tobacco or formed in situ by nitrosation of alkaloids. No *N*-nitroso compounds in non-chewers. Not detected in 4 other cases 25-40 yr old habitual tobacco chewers and controls (non-chewers) Oral cavities of chewers may be constantly exposed to nitroso compounds. Chewing has been associated with oral cancer GLC-TEA; HPLC
SALIVA; DELIBERATE EXPOSURE; INDIA; NITROSAMINES; TOBACCOS Sipahimalani, A.T.; Chadha, M.S.; Bhidl, S.V.; Pratap, A.I.; Nair, J. 1984 Food and Chemical Toxicology 22(4):261-264				

Dimethylamine, N-nitroso- (8 CI); Methanamine, N-methyl-N-nitroso- (9 CI)
62-75-9
C2-H6-N2-O
MW 74.1, BP 152 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9309 Blood	a) 1 b) 1 c) 4 d) 9 e) 10 Ingestion	a) 0.5-0.2 ug/l b) 0.6-0.4 ug/l c) 0.1-1.1 ug/l d) 0.2-0.8 ug/l e) 0.3-0.8 ug/l	a) Not given b) Not given c) 0.5 ug/l d) 0.4 ug/l e) 0.5 ug/l	a) 1 and 3 hr after test meal. None before meal b) 1 and 3 hr after test meal. 0.3 ug/l before meal c) Lab workers handling nitrosamines, after meal, no fish, cured meat, fruits (i.e. ascorbic acid) d) Other lab workers, same meal e) Controls, same meal Test meal: bacon, spinach, beer, bread 26-50 yr old nonsmokers GC/MS

ADULTS; UNITED KINGDOM; BLOOD; COMPARATIVE EVALUATIONS; FOODS; MEAT; VEGETABLES; DIETS; ENVIRONMENTAL EXPOSURE; DELIBERATE EXPOSURE; OCCUPATIONAL EXPOSURE
Gough, T.A.; Webb, K.S.; Swann, P.F. 1983 Food and Chemical Toxicology 21(2):151-156

Tissue	Cases Exposure Route	Range	Mean	General Information
9210 Milk	15	Not detectable->1.0 ppb	Not given	Nitrosamines undetected in 60% of samples. Levels >0.2 ppb in 23.5%. In additional studies, eating bacon did not increase levels. In some individuals, eating bacon plus a vegetable high in nitrate occasionally increased levels of N-nitrosodimethylamine in milk. Random samples, collected to obtain baseline levels indicated that 76.5% contained <0.2 ppb. Nursing women, 2 wk-9 mo post-partum Chemiluminex

MILK; NITROSAMINES; DIETS; FOOD CONTAMINATION; CONSUMER EXPOSURE; LACTATION; DELIBERATE EXPOSURE
Lakritz, L.; Pensabene, J.W. 1984 Food and Chemical Toxicology 22(9):721-724

Tissue	Cases Exposure Route	Range	Mean	General Information
9211 Saliva	2 Ingestion	5-11 ng/ml	8 ng/ml	Tobacco chewers. Compounds from tobacco or formed in situ by nitrosation of alkaloids. No *N*-nitroso compounds in non-chewers. Not detected in 5 other cases 25-40 yr old habitual tobacco chewers and controls (non-chewers) Oral cavities of chewers may be constantly exposed to nitroso compounds. Chewing has been associated with oral cancer GLC-TEA; HPLC

SALIVA; DELIBERATE EXPOSURE; INDIA; NITROSAMINES; TOBACCOS
Sipahimalani, A.T.; Chadha, M.S.; Bhidi, S.V.; Pratap, A.I.; Nair, J. 1984 Food and Chemical Toxicology 22(4):261-264

Dipyrido(1,2-a:2',1'-c)pyrasinediium, 6,7-dihydro-
2764-72-9
C12-H12-N2
MW 184.26

Tissue	Cases Exposure Route	Range	Mean	General Information
9213 Blood	1 Ingestion	Not applicable	10.4 mg/l	4 hr after 300 ml of 20% solution (Regione) and 80 mg flunitrazepam (Rohypnol). 6 hr later, level <0.2 mg/l (detection limit). Patient recovered with no somatic sequelae. 33 yr old farmer who attempted suicide Coma, respiratory distress Oro-pharyngeal erosions, ileus, hepatic cytolysis, thrombopenia and renal tubular dysfunction
9218 Urine	1 Ingestion	271-0.5 mg/d	Not given	Total for d 1 and d 13 after 300 ml of 20% solution (Regione) and 80 mg flunitrazepam (Rohypnol). Patient recovered with no somatic sequelae. 33 yr old farmer who attempted suicide Coma, respiratory distress Oro-pharyngeal erosions, ileus, hepatic cytolysis, thrombopenia and renal tubular dysfunction
URINE; BLOOD; DELIBERATE EXPOSURE; ADULTS; HERBICIDES; SUICIDE Mahieu, P.; Bonduelle, Y.; Bernard, A.; De Cabooter, A.; Gala, M.; Hassoun, A.; Koenig, J.; Lauwerys, R. 1984 Clinical Toxicology 22(4):363-369				

Ergocalciferol (8 CI); 9,10-Secoergosta-5,7,10(19),22-tetraen-3-ol, (3beta,5Z,7E,22E)- (9 CI)
50-14-6
C28-H44-O
MW 396.65, MP 115-118 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9214 Milk				Review of levels of vitamin D and metabolites measured in human breast milk by various methods.
MILK; VITAMIN D; METABOLITES; REVIEW; MEASUREMENT METHODS; LACTATION; NUTRITIONAL DEFICIENCIES; DIETS; DRUGS Makin, H.L.J.; Seamark, D.A.; Trafford, D.J.H. 1983 Archives of Disease in Childhood 58(9):750-753				

Ethane, 1,1-dichloro-2-(o-chlorophenyl)-2-(p-chlorophenyl)- (8 Cl); Benzene, 1-chloro-2-(2,2-dichloro-1-(4-chlorophenyl)ethyl)- (9 Cl)
53-19-0
C14-H10-Cl4
MW 320.05, MP 76-78 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9215 Blood, serum	a) 7 b) 8 c) 9 d) 7	a) Not given b) Not given c) Not given d) Not given	a) 2.21+/-3.38 ppb b) 3.82+/-3.40 ppb c) 5.36+/-3.97 ppb d) 8.46+/-9.57 ppb	a) Controls, normal 2nd trimester pregnancies, no missed abortions b) Low serum PCB, recent missed abortions (mean 1.62) c) High serum PCB, recent missed abortions (mean 1.50) d) Former missed abortions (mean 3.43) In missed abortions, products of conception were retained in utero at least 6 wk after fetal death, which occurred before week 20 of gestation. Women with missed abortions (mean age 26.1 yr for high PCB group) and controls (mean age 24.7 yr) GC

ADULTS; BLOOD SERUM; CHLORINE ORGANIC COMPOUNDS; DDD; DDE; DDT; DIELDRIN; HEPTACHLOR EPOXIDE; INSECTICIDES; LINDANE; PESTICIDES; POLYCHLORINATED BIPHENYLS; BIOACCUMULATION; PESTICIDE RESIDUES; PREGNANCY; ENVIRONMENTAL EXPOSURE

Bercovici, B.; Wassermann, M.; Cucos, S.; Ron, M.; Wassermann, D.; Pines, A. 1983 Environmental Research 30:169-174

Tissue	Cases Exposure Route	Range	Mean	General Information
9216 Milk	a) 54 b) 102	a) None detected b) None detected	a) None detected b) None detected	a) Hawaii b) Mainland USA Sampled up to 1 mo postpartum. Lipid basis. 1979-80 GC

HAWAII; UNITED STATES; ADULTS; MILK; ALDRIN; CHLORINATED HYDROCARBONS; CHLORINE ORGANIC COMPOUNDS; DDD; DDE; DDT; DIELDRIN; HEPTACHLOR EPOXIDE; HEPTACHLOROCYCLOHEXANE; HEXACHLOROBENZENE; LINDANE; NONACHLOR; OXYCHLORDANE; POLYCHLORINATED BIPHENYLS; PESTICIDE RESIDUES; POPULATION EXPOSURE; ENVIRONMENTAL EXPOSURE

Takei, G.H.; Kanahikaua, S.M.; Leong, G.H. 1983 Bulletin of Environmental Contamination and Toxicology 30:606-613

Ethane, 1,1-dichloro-2,2-bis(p-chlorphenyl)- (8 Cl); Benzene, 1,1'-(2,2-dichloroethylidene)bis(4-chloro- (9 Cl)
72-54-8
C14-H10-Cl4
MW 320.05, MP 109-110 C, BP 193 C at 1 mm Hg

Tissue	Cases Exposure Route	Range	Mean	General Information
9217 Adipose	a) 91 b) 84	a) Not detected-80 ng/g b) Not detected-50 ng/g	a) 14+/-11 ng/g b) 9+/-8 ng/g	a) Kingston b) Ottawa Single samples from greater omentum of each cadaver. Significant difference. In general, residue values in entire survey of 20 compounds slightly higher in Kingston. No significant differences by sex Autopsies, unembalmed cadavers, 11/79-1/81, Kingston, Ontario (a Great Lakes Community) and 11/80-1/81, Ottawa, Ontario (outside Great Lakes Basin), Canada. Age ranges 7-88 yr, 16-91 yr, respectively. GC/MS

ADIPOSE TISSUE; CANADA; AUTOPSIES; PESTICIDES; ENVIRONMENTAL EXPOSURE; CHLORINE ORGANIC COMPOUNDS; CHLOROBENZENES; WATER POLLUTION

Williams, D.T.; LeBel, G.L.; Junkins, E. 1984 Journal of Toxicology and Environmental Health 13:19-29

Ethane, 1,1-dichloro-2,2-bis(p-chlorphenyl)- (8 CI); Benzene, 1,1'-(2,2-dichloroethylidene)bis(4-chloro- (9 CI)
72-54-8
C14-H10-Cl4
MW 320.06, MP 109-110 C, BP 193 C at 1 mm Hg

Tissue	Cases Exposure Route	Range	Mean	General Information
9218 Blood	36	a) Not detected-17.2 ppb b) Not detected-12.2 ppb c) Not detected-25 ppb d) Not detected-22.1 ppb	a) 5.3 ppb b) 5.6 ppb c) 6.2 ppb d) 4.1 ppb	a) Maternal, live births, 27 cases b) Maternal, stillbirths, 9 cases c) Cord, live births, 27 cases d) Cord, stillbirths, 9 cases Pregnant women, Lucknow, India GC-EC; TLC

INDIA; ADULTS; NEWBORN; BLOOD; PLACENTA; ALDRIN; CHLORINE ORGANIC COMPOUNDS; DDD; DDE; DDT; HEXACHLOROCYCLOHEXANE; LINDANE; BIOACCUMULATION; METABOLITES; PESTICIDE RESIDUES; POPULATION EXPOSURE; PREGNANCY; ENVIRONMENTAL EXPOSURE

Saxena, M.C.; Siddiqui, M.K.J.; Agarwal, V.; Kuuty, D. 1983 Journal of Toxicology and Environmental Health 11:71-79

Tissue	Cases Exposure Route	Range	Mean	General Information
9219 Blood, serum	93	a) Not given b) Not given c) Not given d) Not given e) Not given f) Not given	a) 1.2+/-2.0 ug/l b) 2.4+/-5.9 ug/l c) 14.7+/-68.1 ug/l d) 10.7+/-44.5 ug/l e) 0.6+/-1.8 ug/l f) 2.8+/-13.8 ug/l	1) Mothers, Zagreb, 12 positive samples b) Children, Zagreb, 17 positive samples c) Mothers, Titov Veles, 5 positive samples d) Children, Titov Veles, 3 positive samples e) Mothers, Pula, 5 positive samples f) Children, Pula, 5 positive samples Significant differences: c) froma) and c) from e), ($p<0.01$). Mothers, newborns, during 1978-81. 1-2 days postpartum. U. of Zagreb, Medical Center Jitov Veles, Medical Center Pula, Yugoslavia GC

ENVIRONMENTAL EXPOSURE; PESTICIDES; BLOOD SERUM; YUGOSLAVIA; NEWBORN; INFANTS; CHLORINE; ORGANIC COMPOUNDS; DDD; DDE; DDT; HEXACHLOROCYCLOHEXANE; PESTICIDE RESIDUES; LINDANE; POPULATION EXPOSURE; PREGNANCY

Basulic, D.; Stampar-Plasaj, B.; Bujanovic, V.; Stojanovski, N.; Nastev, B.; Rudelic, I.; Sisul, N.; Zurek, A. 1984 Bulletin of Environmental Contamination and Toxicology 32:265-268

Tissue	Cases Exposure Route	Range	Mean	General Information
9220 Blood, serum	a) 7 b) 8 c) 9 d) 7	a) Not given b) Not given c) Not given d) Not given	a) 5.81+/-2.18 ppb b) 6.16+/-4.28 ppb c) 6.06+/-4.00 ppb d) 4.51+/-3.43 ppb	a) Controls, normal 2nd trimester pregnancies, no missed abortions b) Low serum PCB, recent missed abortions (mean 1.62) c) High serum PCB, recent missed abortions (mean 1.50) d) Former missed abortions (mean 3.43) In missed abortions, products of conception were retained in utero at least 6 wk after fetal death, which occured before week 20 of gestation. Women with missed abortions (mean age 28.1 yr for high PCB group) and controls (mean age 24.7 yr) GC

ADULTS; BLOOD SERUM; CHLORINE ORGANIC COMPOUNDS; DDD; DDE; DDT; DIELDRIN; HEPTACHLOR EPOXIDE; INSECTICIDES; LINDANE; PESTICIDES; POLYCHLORINATED BIPHENYLS; BIOACCUMULATION; PESTICIDE RESIDUES; PREGNANCY; ENVIRONMENTAL EXPOSURE

Bercovici, B.; Wassermann, M.; Cucos, S.; Ron, M.; Wassermann, D.; Pines, A. 1983 Environmental Research 30:169-174

Ethane, 1,1-dichloro-2,2-bis(p-chlorphenyl)- (8 CI); Benzene, 1,1'-(2,2-dichloroethylidene)bis(4-chloro- (9 CI)
72-54-8
C14-H10-Cl4
MW 320.05, MP 109-110 C, BP 193 C at 1 mm Hg

Tissue	Cases Exposure Route	Range	Mean	General Information
9221 Placenta	a) 27 b) 9	a) Not detected-18.3 ppb b) Not detected-31.6 ppb	a) 5.0 ppb b) 7.6 ppb	a) Live births b) Stillbirths Pregnant women, Lucknow, India GC-EC; TLC
INDIA; ADULTS; NEWBORN; BLOOD; PLACENTA; ALDRIN; CHLORINE ORGANIC COMPOUNDS; DDD; DDE; DDT; HEXACHLOROCYCLOHEXANE; LINDANE; BIOACCUMULATION; METABOLITES; PESTICIDE RESIDUES; POPULATION EXPOSURE; PREGNANCY; ENVIRONMENTAL EXPOSURE Saxena, M.C.; Siddiqui, M.K.J.; Agarwal, V.; Kuuty, D. 1983 Journal of Toxicology and Environmental Health 11:71-79				

Ethane, 1,1,1-trichloro-
71-55-6
C2-H3-Cl3
MW 133.42, MP -30.41 C, BP 74.1 C, VP 100 mm Hg at 20 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9222 Blood	6 Inhalation	a) Not given b) Not given	a) 1752+/-90 ug/L b) 153+/-27 ug/L	a) End of 6 hr exposure, 350 ppm b) End of 6 hr exposure, 35 ppm Levels at 1.5, 16 and 40 hr post-exposure were 59%, 7% and 0% of 6 hr levels 26-54 yr old (mean 43) healthy volunteers GC
9223 Breath	6 Inhalation	a) 1050-1.2 ug/l b) 150-0.5 ug/l	a) Not given b) Not given	a) End of and 9 d after 6 hr exposure, 350 ppm b) End of and 9 d after 6 hr exposure, 35 ppm 91% of absorbed MC eliminated unchanged in breath 26-54 yr old (mean 43) healthy volunteers GC
BLOOD; DELIBERATE EXPOSURE; ADULTS; FUMES; INHALATION Nolan, R.J.; Preshour, N.L.; Rick, D.L.; McCarty, L.P.; Saunders, J.H. 1984 Fundamental and Applied Toxicology 4:654-662				

Tissue	Cases Exposure Route	Range	Mean	General Information
9224 Breath	a) 9 b) 3	a) 0.12-85.0 ug/cu m b) 0.29-7.65 ug/cu m	a) 4.6 ug/cu m (median) 4.4, 1.7, 6.2 ug/cu m b) 0.61 ug/cu m (median)	a) Bayonne and Elizabeth, NJ. Jul, Sept, Dec 1980 geometric means. 4 chemical and oil workers, 4 persons with no occupational exposure, 1 sewage plant operator. Levels in occupational unexposed significantly (0.10) higher than in exposed b) Research Triangle Park, NC subjects with no occupational exposure Transmitted almost exclusively through air, food unimportant. Adult volunteers GC-MS
BREATH; ENVIRONMENTAL EXPOSURE; OCCUPATIONAL EXPOSURE; NEW JERSEY; NORTH CAROLINA; CHLORINATED HYDROCARBONS; CHLORINE ORGANIC COMPOUNDS; VOLATILE ORGANIC COMPOUNDS; BIOLOGICAL MONITORING; DRINKING WATER; FOODS Wallace, L.A.; Pellizzari, E.; Hartwell, T.; Rosenzweig, M.; Erickson, M.; Sparacino, C.; Zelon, H. 1984 Environmental Research 35:293-319				

Ethane, 1,1,1-trichloro-2-(o-chlorophenyl)-2-(p-chlorophenyl)- (8 CI); Benzene, 1-chloro-2-(2,2,2-trichloro-1-(4-chlorophenyl)ethyl)- (9 CI)
789-02-6
C14-H9-Cl5
MW 354.49, BP 74-74.5 C (cor)

Tissue	Cases Exposure Route	Range	Mean	General Information
9225 Blood, serum	93	a) Not given b) Not given c) Not given d) Not given e) Not given f) Not given	a) 0.3+/-0.9 ug/l b) 1.0+/-1.9 ug/l c) 1.2+/-6.2 ug/l d) 2.2+/-12.4 ug/l e) <0.1 ug/l f) 0.9+/-5.0 ug/l	1) Mothers, Zagreb, 14 positive samples b) Children, Zagreb, 11 positive samples c) Mothers, Titov Veles, 2 positive samples d) Children, Titov Veles, 1 positive samples e) Mothers, Pula, 0 positive samples f) Children, Pula, 1 positive sample Significant differences: c) from a) and c) from e), ($p<0.01$). Mothers, newborns, during 1978-81. 1-2 days postpartum. U. of Zagreb, Medical Center Jitov Veles, Medical Center Pula, Yugoslavia GC
ENVIRONMENTAL EXPOSURE; PESTICIDES; BLOOD SERUM; YUGOSLAVIA; NEWBORN; INFANTS; CHLORINE; ORGANIC COMPOUNDS; DDD; DDE; DDT; HEXACHLOROCYCLOHEXANE; PESTICIDE RESIDUES; LINDANE; POPULATION EXPOSURE; PREGNANCY Bazulic, D.; Stampar-Plasaj, B.; Bujanovic, V.; Stojanovski, N.; Nastev, B.; Rudelic, I.; Sisul, N.; Zusek, A. 1984 Bulletin of Environmental Contamination and Toxicology 32:265-268				

Tissue	Cases Exposure Route	Range	Mean	General Information
9226 Milk	a) 54 b) 102	a) Not detected b) Not detected-0.046 ppm	a) Not detected b) 0.032 +or- 0.009 ppm	a) Hawaii b) Mainland USA Sampled up to 1 mo postpartum. Lipid basis. Mean of positive residues. 1979-80 GC
HAWAII; UNITED STATES; ADULTS; MILK; ALDRIN; CHLORINATED HYDROCARBONS; CHLORINE ORGANIC COMPOUNDS; DDD; DDE; DDT; DIELDRIN; HEPTACHLOR EPOXIDE; HEPTACHLOROCYCLOHEXANE; HEXACHLOROBENZENE; LINDANE; NONACHLOR; OXYCHLORDANE; POLYCHLORINATED BIPHENYLS; PESTICIDE RESIDUES; POPULATION EXPOSURE; ENVIRONMENTAL EXPOSURE Takei, G.H.; Kauahikaua, S.M.; Leong, G.H. 1983 Bulletin of Environmental Contamination and Toxicology 30:606-613				

Ethane, 1,1,1-trichloro-2,2-bis(p-chlorophenyl)- (8 CI); Benzene, 1,1'-(2,2,2-trichloroethylidene)bis(4-chloro- (9 CI)
50-29-3
C14-H9-Cl5
MW 354.50, MP 108.5-109 C, BP 260 C, VP 1.5X10(E-7) mm Hg at 20 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9227 Adipose	a) 91 b) 86	a) Not detected-740 ng/g b) Not detected-740 ng/g	a) 159+/-156 ng/g b) 128+/-107 ng/g	a) Kingston b) Ottawa Single samples from greater omentum of each cadaver. In general, residue values in entire survey of 20 compounds slightly higher in Kingston. No significant differences by sex Autopsies, unembalmed cadavers, 11/79-1/81, Kingston, Ontario (a Great Lakes Community) and 11/80-1/81, Ottawa, Ontario (outside Great Lakes Basin), Canada. Age ranges 7-88 yr, 16-91 yr, respectively. GC/MS
ADIPOSE TISSUE; CANADA; AUTOPSIES; PESTICIDES; ENVIRONMENTAL EXPOSURE; CHLORINE ORGANIC COMPOUNDS; CHLOROBENZENES; WATER POLLUTION Williams, D.T.; LeBel, G.L.; Junkins, E. 1984 Journal of Toxicology and Environmental Health 13:19-29				

Ethane, 1,1,1-trichloro-2,2-bis(p-chlorophenyl)- (8 CI); Benzene, 1,1'-(2,2,2-trichloroethylidene)bis(4-chloro- (9 CI)
50-29-3
C14-H9-Cl5
MW 354.50, MP 108.5-109 C, BP 260 C, VP 1.5X10(E-7) mm Hg at 20 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9226 Blood	16	a) Not given b) Not given c) Not given d) Not given e) Not given f) Not given g) Not given h) Not given	a) 0.4 ng b) 0.3 ng c) 0.2 ng d) 0.1 ng e) 0.1 ng f) 0.2 ng g) 0.1 ng h) Trace (<0.05) /g whole blood	a) 7 d after parturition b) 14 d c) 28 d d) 42 d e) 56 d f) 70 d g) 84 d h) 98 d Average of samples collected at each time period. No correlation between levels in milk and blood. Mothers, mean age 35+/-2 yr, mean wt 125+/-8 lb, National Capital Region, (Ottawa), Canada GC

BLOOD; MILK; ENVIRONMENTAL EXPOSURE; CANADA; ADULTS; PESTICIDES; POLYCHLORINATED BIPHENYLS; CHLORINE ORGANIC COMPOUNDS; LACTATION; PESTICIDE RESIDUES; DIELDRIN; DDT; DDE; OXYCHLORDANE; NONACHLOR; HEPTACHLOR EPOXIDE; HEXACHLOROBENZENE; BIOACCUMULATION

Mes, J.; Doyle, J.A.; Adams, B.R.; Davies, D.J.; Turton, D. 1984 Archives of Environmental Contamination and Toxicology 13:217-223

Tissue	Cases Exposure Route	Range	Mean	General Information
9229 Blood, serum	93	a) Not given b) Not given c) Not given d) Not given e) Not given f) Not given	a) 8.1+/-9.0 ug/l b) 3.2+/-3.3 ug/l c) 11.2+/-54.5 ug/l d) 12.9+/-38.3 ug/l e) 3.6+/-7.8 ug/l f) 34.3+/-171.5 ug/l	1) Mothers, Zagreb, 26 positive samples b) Children, Zagreb, 21 positive samples c) Mothers, Titov Veles, 5 positive samples d) Children, Titov Veles, 4 positive samples e) Mothers, Pula, 17 positive samples f) Children, Pula, 14 positive samples Significant differences: c) from a) and c) from e), ($p<0.01$). Mothers, newborns, during 1978-81. 1-2 days postpartum. U. of Zagreb, Medical Center Jitov Veles, Medical Center Pula, Yugoslavia GC

ENVIRONMENTAL EXPOSURE; PESTICIDES; BLOOD SERUM; YUGOSLAVIA; NEWBORN; INFANTS; CHLORINE; ORGANIC COMPOUNDS; DDD; DDE; DDT; HEXACHLOROCYCLOHEXANE; PESTICIDE RESIDUES; LINDANE; POPULATION EXPOSURE; PREGNANCY

Bazulic, D.; Stampar-Plasaj, B.; Bujanovic, V.; Stojanovski, N.; Nastev, B.; Rudelic, I.; Sisul, N.; Zusek, A. 1984 Bulletin of Environmental Contamination and Toxicology 32:265-268

Ethane, 1,1,1-trichloro-2,2-bis(p-chlorophenyl)- (8 CI); Benzene, 1,1'-(2,2,2-trichloroethylidene)bis(4-chloro- (9 CI)
50-29-3
C14-H9-Cl5
MW 354.50, MP 108.5-109 C, BP 260 C, VP 1.5X10(E-7) mm Hg at 20 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9280 Milk	16	a) Not given b) Not given c) Not given d) Not given e) Not given f) Not given g) Not given h) Not given	a) 5.3 ng b) 5.5 ng c) 5.3 ng d) 5.3 ng e) 4.8 ng f) 4.1 ng g) 3.8 ng h) 5.0 ng /g whole milk	a) 7 d after parturition b) 14 d c) 28 d d) 42 d e) 56 d f) 70 d g) 84 d H) 98 d Average of samples collected at each time period. No correlation between levels in milk and blood. Accumulation of residue in infant body fat theoretically estimated to increase rapidly during 1st 3 mo of breastfeeding, eventually equal to or greater than adult levels Mothers, mean age 35+/-2 yr, mean wt 125+/-8 lb, National Capital Region, (Ottawa), Canada GC

BLOOD; MILK; ENVIRONMENTAL EXPOSURE; CANADA; ADULTS; PESTICIDES; POLYCHLORINATED BIPHENYLS; CHLORINE ORGANIC COMPOUNDS; LACTATION; PESTICIDE RESIDUES; DIELDRIN; DDT; DDE; OXYCHLORDANE; NONACHLOR; HEPTACHLOR EPOXIDE; HEXACHLOROBENZENE; BIOACCUMULATION

Mes, J.; Doyle, J.A.; Adams, B.R.; Davies, D.J.; Turton, D. 1984 Archives of Environmental Contamination and Toxicology 13:217-223

Tissue	Cases Exposure Route	Range	Mean	General Information
9281 Milk, fat	a) 57 b) 4	a) 0.08-0.52 mg/kg fat b) 0.11-0.13 mg/kg fat	a) 0.11 mg/kg fat b) 0.12 mg/kg fat	a) Samples from Copenhagen (10), Naestved (6), Odense (11), Bornholm (10), Sonderborg (8), Aalborg (10). Foremilk and hindmilk collected May-Dec 1982, 4-113 days postpartum b) Pools of equal parts from 9 mothers, Copenhagen, Feb 1982 Levels similar in individual and pooled samples. No immediate health risk to infants. Mothers with normal, healthy babies, 10 with low wt babies, Denmark GC-EC

MILK; ENVIRONMENTAL EXPOSURE; DENMARK; COMPARATIVE EVALUATIONS; CHLORINATED HYDROCARBONS; CHLORINE ORGANIC COMPOUNDS; CHLOROBENZENES; DDE; DDT; DIELDRIN; HEXACHLOROCYCLOHEXANE; HEXACHLOROBENZENE; POLYCHLORINATED BIPHENYLS

Andersen, J.R.; Orbaek, K. 1984 Ambio 13(4):266-268

Ethane, 1,1,2-trichloro-
79-00-5
C2-H3-Cl3
MW 133.42, MP -36.5 C, BP 113.77 C at 760 mm Hg

Tissue	Cases Exposure Route	Range	Mean	General Information
9252 Breath	a) 9 b) 8	a) 0.07-5.18 ug/cu m b) 0.21-0.20 ug/cu m	a) 0.2 ug/cu m b) Not given Median	a) Bayonne and Elizabeth, NJ. 4 chemical and oil workers, 4 persons with no occupational exposure, 1 sewage plant operator b) Research Triangle Park, NC subjects with no occupational exposure. Food generally unimportant as exposure route. Adult volunteers GC-MS
BREATH; ENVIRONMENTAL EXPOSURE; OCCUPATIONAL EXPOSURE; NEW JERSEY; NORTH CAROLINA; CHLORINATED HYDROCARBONS; CHLORINE ORGANIC COMPOUNDS; VOLATILE ORGANIC COMPOUNDS; BIOLOGICAL MONITORING; DRINKING WATER; FOODS Wallace, L.A.; Pellizzari, E.; Hartwell, T.; Rosenzweig, M.; Erickson, M.; Sparacino, C.; Zelon, H. 1984 Environmental Research 35:293-319				

Ethane, 1,1,2-trichloro-1,2,2-trifluoro-
76-13-1
C2-Cl3-F3
MW 187.38, MP -36.4 C, BP 47.7 C at 760 mm Hg

Tissue	Cases Exposure Route	Range	Mean	General Information
9253 Blood	a) 1 b) 1 Inhalation	a) Not applicable b) Not applicable	a) 0.4 ug/g b) Trace	a) Worked in degreasing tank <45 min. Air sample 37 hr later indicated probable level of 128,000 ppm b) Checked for leak from compressed air lines on marine vessel, death within 1.5 hr TLV=1,000 ppm, OSHA guidlines consider 4500 ppm dangerous to life/health. 19 and 25 yr old males Deaths from cardiac arrhythmia.
9254 Brain	1 Inhalation	Not applicable	110.6 mg/kg	Checked for leaks in compressed air lines on marine vessel, death within 1.5 hr. 25 yr old male
9255 Liver	1 Inhalation	Not applicable	5.6 mg/kg	Checked for leaks in compressed air lines on marine vessel, death within 1.5 hr. 25 yr old male
9256 Lung	1 Inhalation	Not applicable	0.4 ug/g	Worked in degreasing tank <45 min. Air sample 37 hr later indicated probable level of 128,000 ppm. TLV=1,000 ppm, OSHA guidlines consider 4500 ppm dangerous to life/health. 19 yr old male
OCCUPATIONAL EXPOSURE; OCCUPATIONAL HAZARDS; FUMES; INHALATION; INDUSTRIAL ACCIDENTS; CASE HISTORIES; AUTOPSIES; BLOOD; LUNGS; LIVER May, D.C.; Blotzer, M.J. 1984 Archives of Environmental Health 39(5):352-354				

Ethane, 1,2-dibromo
106-93-4
C2-H4-Br2
MW 187.88, MP 9.79 C, BP 131-132 C, VP 11 mm Hg at 25 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9287 Adipose	1 Dermal	Not applicable	2.8 ug/g	Postmortem. Exposed 20-30 min inside tank. Death 64 hr after exposure. 15-41 ppm in tank 20 hr after exposure. 46 yr old male supervisor (105 kg), fertilizer-pesticide storage facility, San Joaquin Valley, CA Metabolic acidosis, acute renal and hepatic failure and necrosis of skeletal muscle and other organs GC
9288 Brain	1 Dermal	Not applicable	0.5 ug/g	Postmortem. Exposed 20-30 min inside tank. Death 64 hr after exposure. 15-41 ppm in tank 20 hr after exposure. 46 yr old male supervisor (105 kg), fertilizer-pesticide storage facility, San Joaquin Valley, CA GC
9289 Skin	1 Dermal	a) Not applicable b) Not applicable	a) 1.6 ug/g b) 3.6 ug	a) Postmortem, thoracic samples with subcutaneous fat b) Leg Exposed 20-30 min inside tank. Death 64 hr after exposure. 15-41 ppm in tank 20 hr after exposure. 46 yr old male supervisor (105 kg), fertilizer-pesticide storage facility, San Joaquin Valley, CA Metabolic acidosis, acute renal and hepatic failure and necrosis of skeletal muscle and other organs GC
BLOOD SERUM; SKIN; ADIPOSE TISSUE; BRAIN; OCCUPATIONAL EXPOSURE; CALIFORNIA; BROMIDE; PESTICIDES; INDUSTRIAL ACCIDENTS; INDUSTRIAL AREAS; INDUSTRIES; FUMES; HEALTH HAZARDS; OCCUPATIONAL HAZARDS; AUTOPSIES Lets, G.A.; Pond, S.M.; Osterloh, J.D.; Wade, R.L.; Becker, C.E. 1984 Journal of the American Medical Association 252(17):2428-2431				

Ethane, 1,2-dichloro-
107-06-2
C2-H4-Cl2
MW 98.96, MP -35.36 C, BP 83.5 C, VP 100 mm Hg at 29.4 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9240 Breath	a) 9 b) 3	a) 0.12-0.69 ug/cu m b) 0.12-0.50 ug/cu m	a) 0.1 ug/cu m b) Not given Median	a) Bayonne and Elizabeth, NJ. 4 chemical and oil workers, 4 persons with no occupational exposure, 1 sewage plant operator b) Research Triangle Park, NC subjects with no occupational exposure. Food generally unimportant as exposure route. Adult volunteers GC-MS
BREATH; ENVIRONMENTAL EXPOSURE; OCCUPATIONAL EXPOSURE; NEW JERSEY; NORTH CAROLINA; CHLORINATED HYDROCARBONS; CHLORINE ORGANIC COMPOUNDS; VOLATILE ORGANIC COMPOUNDS; BIOLOGICAL MONITORING; DRINKING WATER; FOODS Wallace, L.A.; Pellizzari, E.; Hartwell, T.; Rosenzweig, M.; Erickson, M.; Sparacino, C.; Zelon, H. 1984 Environmental Research 35:293-319				

Ethane, 2-bromo-2-chloro-1,1,1-trifluoro-
151-67-7
C2-H-Br-Cl-F3
MW 197.39, BP 50.2 C, 20 C at 240 mm Hg

Tissue	Cases Exposure Route	Range	Mean	General Information
9241 Milk				Review. Levels after occupational exposures to trace metals, solvents, and halogenated hydrocarbons, discussed in terms of milk partition factors, potential infant exposures, possible health effects.
MILK; ENVIRONMENTAL EXPOSURE; ADULTS; REVIEW; MERCURY; LEAD; DDT; DIELDRIN; POLYCHLORINATED BIPHENYLS; POLYBROMINATED BIPHENYLS; CHROMIUM; CADMIUM; HEPTACHLOR EPOXIDE; OXYCHLORDANE; BIOACCUMULATION; LACTATION; HEALTH HAZARDS				
Wolff, M.S. 1983 American Journal of Industrial Medicine 4:259-281				

Ethanol, 2,2,2-trichloro-
115-20-8
C2-H3-Cl3-O
MW 149.42, MP 18 C, BP 151-153 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9242 Blood	6 Inhalation	a) Not given b) Not given	a) 450 ug/l b) 70 ug/l	a) End of 6 hr exposure, 350 ppm methyl chloroform b) End of 6 hr exposure, 35 ppm methyl chloroform Metabolite of methyl chloroform 26-54 yr old (mean 43) healthy volunteers GC
9243 Breath	6 Inhalation	Not given	<60 ng/l	End of 6 hr exposure 350 ppm methyl chloroform. Undetected in 35 ppm exposure. Metabolite of methyl chloroform. 26-54 yr old (mean 43) healthy volunteers GC
9244 Urine	6 Inhalation	a) 300-3 ug/hr b) 60-0.7 ug/hr	a) Not given b) Not given	a) 12 hr and 9 d after start of 6 hr exposure, 350 ppm methyl chloroform b) 12 hr and 9 d after start of 6 hr exposure, 35 ppm methyl chloroform Total excreted was 12.7 mg (350 ppm) and 1.9 mg (35 ppm). Metabolite of methyl chloroform 26-54 yr old (mean 43) healthy volunteers GC
BLOOD; DELIBERATE EXPOSURE; ADULTS; FUMES; INHALATION				
Nolan, R.J.; Freshour, N.L.; Rick, D.L.; McCarty, L.P.; Saunders, J.H. 1984 Fundamental and Applied Toxicology 4:654-662				

Ethylamine, 2-(diphenylmethoxy)-N,N-dimethyl- (8 CI); Ethanamine, 2-(diphenylmethoxy)-N,N-dimethyl- (9 CI)
58-73-1
C17-H21-N-O
MW 255.35, BP 150-165 C at 2.0 mm Hg

Tissue	Cases Exposure Route	Range	Mean	General Information
9245 Urine	1 Ingestion	Not applicable	3.8 mg/L	At autopsy. Known medication was 100 mg/d cimetidine, unstated amounts methyprylon, oxazepam and tetracycline. 30 yr old female under psychiatric care, death from self-inflicted gunshot wound. GC/MS
DRUGS; DELIBERATE EXPOSURE; AUTOPSIES; SUICIDE; BLOOD; URINE; BRAIN; BILE Semple, D.J. 1984 Journal of Analytical Toxicology 8:285-287				

Ethylene glycol (8 CI); 1,2-Ethanediol (9 CI)
107-21-1
C2-H6-O2
MW 62.1, BP 197.5 C, VP 0.05 mm Hg at 20 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9246 Blood, serum	1 Ingestion	0-1.9 g/l	Not given	0 and approximately 22 hr after drinking 500 ml antifreeze, peak at 6 hr. Successful therapy was: ethanol, hemodialysis, gastric lavage. Toxic level considered 0.5 g/l 36 yr old man
BLOOD SERUM; DELIBERATE EXPOSURE; UNITED KINGDOM; CASE HISTORIES; HEMODIALYSIS; LAVAGE; METHANOL; ALCOHOLS; ANTIFREEZE Vitez, N.P.; Payne, C.R.; Gokal, R. 1984 Lancet 1(8376):562				

Ethylene, tetrachloro- (8 CI); Ethene, tetrachloro- (9 CI)
127-18-4
C2-Cl4
MW 165.85, BP 121 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9247 Blood	26 Inhalation	a) 0.1-0.8 mg/l b) 0.4-3.1 mg	a) 0.4 mg/l b) 1.2 mg/l	a) Before exposure b) 0.5 hr after exposure to time weighted mean of 20.8 ppm Dry cleaning workers, mean age 32.0 yr Mucosal irritation, gastrointestinal disturbances, liver & kidney malfunction, CNS effects GC
COMPARATIVE EVALUATIONS; INDUSTRIAL MEDICINE; CHLORINE ORGANIC COMPOUNDS; ADULTS; BLOOD; BREATH; HEALTH HAZARDS; INDUSTRIAL ATMOSPHERES; INDUSTRIAL EMISSIONS; OCCUPATIONAL HAZARDS; OCCUPATIONAL EXPOSURE Lauwerys, R.; Herbrand, J.; Buchet, J.P.; Bernard, A.; Gaussin, J. 1983 International Archives of Occupational and Environmental Health 52:69-77				

Ethylene, tetrachloro- (8 CI); Ethene, tetrachloro- (9 CI)
127-18-4
C2-Cl4
MW 165.85, BP 121 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9248 Breath	a) 6 b) 2 c) 11 d) 1 e) 10 f) 19 Inhalation	a) Not given b) 11-47 ug/cu m c) Not given d) Not given e) Not given f) Not given	a) 24+/-7 ug/cu m b) 29 ug/cu m c) 2.8+/-1.5 cu m d) 2 ug/cu m e) 7.8+/-5.7 ug/cu m f) 1.8+/-1.0 ug/cu m	a) Children b) Teachers c) Controls, children d) Control, teacher e) Staff of home for elderly, first floors f) Elderly living on second floors or higher Mean air levels were: Classrooms, a), b) 24+/-7 ug/cu m, controls, c), d) 1.6 ug/cu m, outdoor air for all 1 ug/cu m. Elderly, first floors 6.2+/-4.1 ug/cu m, second and higher floors 1.6+/-0.8 ug/cu m. Practical to use volatile pollutants in subjects as measure of exposure and estimate of health risk. Teachers and 4-5 yr olds - kindergarten near factory. Elderly (65 yr and older) and staff living near former chemical waste dump. The Netherlands. TLV for workers is 335 mg/cu m, 8 hr/d. Risk at both sites minimal GC

NETHERLANDS; BREATH; AIR POLLUTION; ENVIRONMENTAL EXPOSURE; CHLORINE ORGANIC COMPOUNDS; CHILDREN; AGE
Monster, A.C.; Smolders, J.F.J 1984 International Archives of Occupational and Environmental Health 53:331-336

Tissue	Cases Exposure Route	Range	Mean	General Information
9240 Breath	a) 9 b) 3	a) 0.64-202.0 ug/cu m b) 1.19-60.0 ug/cu m	a) 10.5 ug/cu m (median) 10.1, 4.0, 8.7 ug/cu m b) 4.2 ug/cu m (median)	a) Bayonne and Elizabeth, NC. Jul, Sept, Dec 1980 geometric means. 4 chemical and oil workers, 4 persons with no occupational exposure, 1 sewage plant operator (registered highest levels of all) b) RTP, NC subjects with no occupational exposure Levels in occupationally exposed significantly higher (0.05) than in unexposed, weekday levels higher (0.10) than weekends. Transmitted almost exclusively through air. Adult volunteers GC-MS

BREATH; ENVIRONMENTAL EXPOSURE; OCCUPATIONAL EXPOSURE; NEW JERSEY; NORTH CAROLINA; CHLORINATED HYDROCARBONS; CHLORINE ORGANIC COMPOUNDS; VOLATILE ORGANIC COMPOUNDS; BIOLOGICAL MONITORING; DRINKING WATER; FOODS
Wallace, L.A.; Pellizzari, E.; Hartwell, T.; Rosenzweig, M.; Erickson, M.; Sparacino, C.; Zelon H. 1984 Environmental Research 35:293-319

Tissue	Cases Exposure Route	Range	Mean	General Information
9250 Breath	26 Inhalation	a) 0.1-5.5 ppm b) 0.2-10 ppm	a) 1.9 ppm b) 5.1 ppm	a) Before exposure b) 0.5 hr after exposure to time weighted mean of 20.6 ppm Dry cleaning workers, mean age 32.9 yr Mucosal irritation, gastrointestinal disturbances, liver & kidney malfunction, CNS effects GC

COMPARATIVE EVALUATIONS; INDUSTRIAL MEDICINE; CHLORINE ORGANIC COMPOUNDS; ADULTS; BLOOD; BREATH; HEALTH HAZARDS; INDUSTRIAL ATMOSPHERES; INDUSTRIAL EMISSIONS; OCCUPATIONAL HAZARDS; OCCUPATIONAL EXPOSURE
Lauwerys, R.; Herbrand, J.; Buchet, J.P.; Bernard, A.; Gaussin, J. 1983 International Archives of Occupational and Environmental Health 52:69-77

Ethylene, tetrachloro- (8 CI); Ethene, tetrachloro- (9 CI)
127-18-4
C_2Cl_4
MW 166.85, BP 121 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9251 Breath	7 Inhalation	6.3-52.8 ppm	Not given	End of 8 hr shift Exposed workers, dry cleaning and glue removal processes, Japan. GC
HEALTH HAZARDS; INHALATION; METABOLISM; ADULTS; BREATH; URINE; CHLORINE ORGANIC COMPOUNDS; OCCUPATIONAL HAZARDS Ohtsuki, T.; Sato, K.; Koizumi, A.; Kumai, M.; Ikeda, M. 1983 International Archives of Occupational & Environmental Health 51:381-390				

Tissue	Cases Exposure Route	Range	Mean	General Information
9252 Milk				Review. Levels after occupational exposures to trace metals, solvents, and halogenated hydrocarbons, discussed in terms of milk partition factors, potential infant exposures, possible health effects.
MILK; ENVIRONMENTAL EXPOSURE; ADULTS; REVIEW; MERCURY; LEAD; DDT; DIELDRIN; POLYCHLORINATED BIPHENYLS; POLYBROMINATED BIPHENYLS; CHROMIUM; CADMIUM; HEPTACHLOR EPOXIDE; OXYCHLORDANE; BIOACCUMULATION; LACTATION; HEALTH HAZARDS Wolff, M.S. 1983 American Journal of Industrial Medicine 4:259-281				

Tissue	Cases Exposure Route	Range	Mean	General Information
9253 Urine	7 Inhalation	a) 31-182 mg/l b) 20-104 mg/l	a) Not given b) Not given	a) End of 8 hr shift b) After correction for specific gravity of 1.016 Measured as total tri-chloro compounds. Tetrachloroethylene in air 48-629 ppm. Exposed workers, dry cleaning and glue removal processes, Japan. GC
HEALTH HAZARDS; INHALATION; METABOLISM; ADULTS; BREATH; URINE; CHLORINE ORGANIC COMPOUNDS; OCCUPATIONAL HAZARDS Ohtsuki, T.; Sato, K.; Koizumi, A.; Kumai, M.; Ikeda, M. 1983 International Archives of Occupational & Environmental Health 51:381-390				

Ethylene, trichloro- (8 CI); Ethene, trichloro- (9 CI)
79-01-6
C2-H-Cl3
MW 131.40, MP 75 C, BP 87.1 C, VP 100 mm Hg at 32 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9254 Breath	a) 9 b) 8	a) 0.10-24.5 ug/cu m b) 0.18-2.02 ug/cu m	a) 0.7 ug/cu m b) Not given Median	a) Bayonne and Elizabeth, NJ. 4 chemical and oil workers, 4 persons with no occupational exposure, 1 sewage plant operator (registered highest levels of all) b) Research Triangle Park, NC subjects with no occupational exposure. Transmitted almost exclusively through air but some in margarine. Adult volunteers GC-MS
BREATH; ENVIRONMENTAL EXPOSURE; OCCUPATIONAL EXPOSURE; NEW JERSEY; NORTH CAROLINA; CHLORINATED HYDROCARBONS; CHLORINE ORGANIC COMPOUNDS; VOLATILE ORGANIC COMPOUNDS; BIOLOGICAL MONITORING; DRINKING WATER; FOODS Wallace, L.A.; Pellizzari, E.; Hartwell, T.; Rosenzweig, M.; Erickson, M.; Sparacino, C.; Zelon, H. 1984 Environmental Research 35:293-319				

Ethylene, 1,1-dichloro- (8 CI); Ethene, 1,1-dichloro- (9 CI)
75-35-4
C2-H2-Cl2
MW 96.94, MP -122.1 C, BP 37 C, VP 100 mm Hg at 15 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9255 Breath	8	1.25-6.25 ug/cu m	Not given	Subjects with no occupational exposure. Food unimportant as exposure route. Adult volunteers, Research Triangle Park, NC GC-MS
BREATH; ENVIRONMENTAL EXPOSURE; OCCUPATIONAL EXPOSURE; NEW JERSEY; NORTH CAROLINA; CHLORINATED HYDROCARBONS; CHLORINE ORGANIC COMPOUNDS; VOLATILE ORGANIC COMPOUNDS; BIOLOGICAL MONITORING; DRINKING WATER; FOODS Wallace, L.A.; Pellizzari, E.; Hartwell, T.; Rosenzweig, M.; Erickson, M.; Sparacino, C.; Zelon, H. 1984 Environmental Research 35:293-319				

Ethylene, 1,1-dichloro-2-(o-chlorophenyl)-2-(p-chlorophenyl)- (8 CI); Benzene, 1-chloro-2-(2,2-dichloro-1-(4-chlorophenyl)ethenyl)- (9 CI)
3424-82-6
C14-H8-Cl4
MW 318.03

Tissue	Cases Exposure Route	Range	Mean	General Information
9256 Blood, serum	a) 7 b) 8 c) 9 d) 7	a) Not given b) Not given c) Not given d) Not given	a) 1.93+/-1.46 ppb b) 2.64+/-1.07 ppb c) 2.79+/-2.26 ppb d) 3.75+/-4.76 ppb	a) Controls, normal 2nd trimester pregnancies, no missed abortions b) Low serum PCB, recent missed abortions (mean 1.62) c) High serum PCB, recent missed abortions (mean 1.50) d) Former missed abortions (mean 3.43) In missed abortions, products of conception were retained in utero at least 6 wk after fetal death, which occurred before week 20 of gestation. Women with missed abortions (mean age 28.1 yr for high PCB group) and controls (mean age 24.7 yr) GC
ADULTS; BLOOD SERUM; CHLORINE ORGANIC COMPOUNDS; DDD; DDE; DDT; DIELDRIN; HEPTACHLOR EPOXIDE; INSECTICIDES; LINDANE; PESTICIDES; POLYCHLORINATED BIPHENYLS; BIOACCUMULATION; PESTICIDE RESIDUES; PREGNANCY; ENVIRONMENTAL EXPOSURE Bercovici, B.; Wassermann, M.; Cucos, S.; Ron, M.; Wassermann, D.; Pines, A. 1983 Environmental Research 30:169-174				

Ethylene, 1,1-dichloro-2-(o-chlorophenyl)-2-(p-chlorophenyl)- (8 CI); Benzene, 1-chloro-2-(2,2-dichloro-1-(4-chlorophenyl)ethenyl)- (9 CI)
3424-82-6
C14-H8-Cl4
MW 318.03

Tissue	Cases Exposure Route	Range	Mean	General Information
9257 Milk	a) 54 b) 102	a) None detected b) None detected	a) None detected b) None detected	a) Hawaii b) Mainland USA Sampled up to 1 mo postpartum. Lipid basis. 1970-80 GC

HAWAII; UNITED STATES; ADULTS; MILK; ALDRIN; CHLORINATED HYDROCARBONS; CHLORINE ORGANIC COMPOUNDS; DDD; DDE; DDT; DIELDRIN; HEPTACHLOR EPOXIDE; HEPTACHLOROCYCLOHEXANE; HEXACHLOROBENZENE; LINDANE; NONACHLOR; OXYCHLORDANE; POLYCHLORINATED BIPHENYLS; PESTICIDE RESIDUES; POPULATION EXPOSURE; ENVIRONMENTAL EXPOSURE

Tokei, G.H.; Kauahikaua, S.M.; Leong, G.H. 1983 Bulletin of Environmental Contamination and Toxicology 30:606-613

Ethylene, 1,1-dichloro-2,2-bis(p-chlorophenyl)- (8 CI); Benzene, 1,1'-(dichloroethenylidene)bis(4-chloro- (9 CI)
72-55-9
C14-H8-Cl4
MW 318.02, MP 88.6 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9258 Adipose	a) 18 b) 35 c) 14 d) 21	a) Not given b) Not given c) Not given d) Not given	a) No estimation b) 1.97+/-2.14 ppm c) 1.28+/-0.65 ppm d) 1.26+/-0.76 ppm	a) Cancer deaths, autopsies b) Noncancer deaths, autopsies c) Cancer patients, biopsies d) Noncancer patients, biopsies No significant differences. Accumulation in breast adipose apparently not related to the occurrence of mammary cancer. Autopsies, 48-82 yr old cancer victims, 15-85 yr old noncancer victims. Biopsies, 25-54 yr old cancer patients, 19-64 yr old noncancer patients. Denmark GC

ENVIRONMENTAL EXPOSURE; ADIPOSE TISSUE; DENMARK; AUTOPSIES; CARCINOMAS; BIOPSIES; POLYCHLORINATED BIPHENYLS; DDE

Unger, M.; Kieser, H.; Blichert-Toft, M.; Olsen, J.; Clausen, J. 1984 Environmental Research 34:26-28

Tissue	Cases Exposure Route	Range	Mean	General Information
9259 Adipose	a) 91 b) 84	a) 10-10,100 ng/g b) 80-10,200 ng/g	a) 3256+/-2866 ng/g b) 2557+/-2013 ng/g	a) Kingston b) Ottawa Single samples from greater omentum of each cadaver. In general, residue values in entire survey of 20 compounds slightly higher in Kingston. No significant differences by sex Autopsies, unembalmed cadavers, 11/79-1/81, Kingston, Ontario (a Great Lakes Community) and 11/80-1/81, Ottawa, Ontario (outside Great Lakes Basin), Canada. Age ranges 7-88 yr, 16-91 yr, respectively. GC/MS

ADIPOSE TISSUE; CANADA; AUTOPSIES; PESTICIDES; ENVIRONMENTAL EXPOSURE; CHLORINE ORGANIC COMPOUNDS; CHLOROBENZENES; WATER POLLUTION

Williams, D.T.; LeBel, G.L.; Junkins, E. 1984 Journal of Toxicology and Environmental Health 13:19-29

Ethylene, 1,1-dichloro-2,2-bis(p-chlorophenyl)- (8 CI); Benzene, 1,1'-(dichloroethenylidene)bis(4-chloro- (9 CI)
72-55-9
C14-H8-Cl4
MW 318.02, MP 88.4 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9260 Adipose	7 Ingestion	0.80-1.58 ppm	Not given	Subjects ate meat contaminated with chlorinated pesticides Healthy volunteers, 20-30 yr old GC/MS
ADIPOSE TISSUE; ENVIRONMENTAL EXPOSURE; MICHIGAN; ADULTS; BIOPSIES; BROMINATED HYDROCARBONS; CHLORINATED HYDROCARBONS; DDT; DDE; DIELDRIN; FATS; LIPIDS; PESTICIDES; POLYBROMINATED BIPHENYLS; POLYCHLORINATED BIPHENYLS; ANIMAL FEEDS; ACCIDENTAL POISONING; AGRICULTURE; BIOACCUMULATION; BIOLOGICAL MONITORING; FIRE RETARDANTS; FOOD ADDITIVES; FOOD CONTAMINATION; HEALTH HAZARDS; MEAT; PESTICIDE RESIDUES; POPULATION EXPOSURE Schnare, D.W.; Ben, M.; Shields, M.G. 1984 Ambio 13(5-6):378-380				

Tissue	Cases Exposure Route	Range	Mean	General Information
9261 Blood	16	a) Not given b) Not given c) Not given d) Not given e) Not given f) Not given g) Not given h) Not given	a) 2.8 ng b) 1.6 ng c) 2.7 ng d) 1.1 ng e) 1.7 ng f) 1.3 ng g) 1.0 ng h) 1.7 ng /g whole blood	a) 7 d after parturition b) 14 d c) 28 d d) 42 d e) 56 d f) 70 d g) 84 d H) 98 d Average of samples collected at each time period. No correlation between levels in milk and blood. Mothers, mean age 35+/-2 yr, mean wt 125+/-6 lb, National Capital Region, (Ottawa), Canada GC
BLOOD; MILK; ENVIRONMENTAL EXPOSURE; CANADA; ADULTS; PESTICIDES; POLYCHLORINATED BIPHENYLS; CHLORINE ORGANIC COMPOUNDS; LACTATION; PESTICIDE RESIDUES; DIELDRIN; DDT; DDE; OXYCHLORDANE; NONACHLOR; HEPTACHLOR EPOXIDE; HEXACHLOROBENZENE; BIOACCUMULATION Mes, J.; Doyle, J.A.; Adams, B.R.; Davies, D.J.; Turton, D. 1984 Archives of Environmental Contamination and Toxicology 13:217-223				

Tissue	Cases Exposure Route	Range	Mean	General Information
9262 Blood	101	Not given	3.8+/-0.82 ng/g	Sampled on admission. Median, 2.4 ng/g. All cases had >0.01 ng/g. 26+/-4 yr olds, maternity facility admissions, urban and rural vicinity of Lake Ontario (Rochester and Oswego), and a mixed population from the Hudson River area (Albany), 1977, NY GC
BLOOD; FETAL BLOOD; ENVIRONMENTAL EXPOSURE; NEW YORK; COMPARATIVE EVALUATIONS; HEXACHLOROBENZENE; DDE; POLYCHLORINATED BIPHENYLS; BIOACCUMULATION; POPULATION EXPOSURE; TRANSPLACENTAL TRANSFER; PESTICIDE RESIDUES Bush, B.; Snow, J.; Koblintz, R. 1984 Archives of Environmental Contamination and Toxicology 13:517-527				

Ethylene, 1,1-dichloro-2,2-bis(p-chlorophenyl)- (8 CI); Benzene, 1,1'-(dichloroethenylidene)bis(4-chloro- (9 CI)
72-55-9
C14-H8-Cl4
MW 318.02, MP 88.4 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9263 Blood	56	a) 2.1-47.7 ppb b) 4.5-96.7 ppb c) Not detected-66.2 ppb d) Not detected-10 ppb	a) 12.5 ppb b) 26.8 ppb c) 11.1 ppb d) 5.5 ppb	a) Maternal, live births, 27 cases b) Maternal, stillbirths, 9 cases c) Cord, live births, 27 cases d) Cord, stillbirths, 9 cases Pregnant women, Lucknow, India GC-EC; TLC
INDIA; ADULTS; NEWBORN; BLOOD; PLACENTA; ALDRIN; CHLORINE ORGANIC COMPOUNDS; DDD; DDE; DDT; HEXACHLOROCYCLOHEXANE; LINDANE; BIOACCUMULATION; METABOLITES; PESTICIDE RESIDUES; POPULATION EXPOSURE; PREGNANCY; ENVIRONMENTAL EXPOSURE Saxena, M.C.; Siddiqui, M.K.J.; Agarwal, V.; Kuuty, D. 1983 Journal of Toxicology and Environmental Health 11:71-79				

Tissue	Cases Exposure Route	Range	Mean	General Information
9264 Blood, fetal	97 Transplacental	Not given	1.9+/-0.94 ng/g	Sampled at delivery. Median, 1.0 ng/g. All cases had >0.01 ng/g Fetuses, delivered in urban and rural vicinity of Lake Ontario (Rochester and Oswego), and a mixed population from the Hudson River area (Albany), 1977, NY GC
BLOOD; FETAL BLOOD; ENVIRONMENTAL EXPOSURE; NEW YORK; COMPARATIVE EVALUATIONS; HEXACHLOROBENZENE; DDE; POLYCHLORINATED BIPHENYLS; BIOACCUMULATION; POPULATION EXPOSURE; TRANSPLACENTAL TRANSFER; PESTICIDE RESIDUES Bush, B.; Snow, J.; Koblintz, R. 1984 Archives of Environmental Contamination and Toxicology 13:517-527				

Tissue	Cases Exposure Route	Range	Mean	General Information
9265 Blood, serum	93	a) Not given b) Not given c) Not given d) Not given e) Not given f) Not given	a) 10.7+/-9.5 ug/l b) 6.44+/-3.1 ug/l c) 35.1+/-35.8 ug/l d) 17.3+/-36.0 ug/l e) 11.2+/-8.3 ug/l f) 6.3+/-11.1 ug/l	1) Mothers, Zagreb, 31 positive samples b) Children, Zagreb, 20 positive samples c) Mothers, Titov Veles, 26 positive samples d) Children, Titov Veles, 21 positive samples e) Mothers, Pula, 30 positive samples f) Children, Pula, 23 positive samples. Significant differences between c) and a) c) and e) ($p<0.01$). Mothers, newborns, during 1978-81. 1-2 days postpartum. U. of Zagreb, Medical Center Jitov Veles, Medical Center Pula, Yugoslavia GC
ENVIRONMENTAL EXPOSURE; PESTICIDES; BLOOD SERUM; YUGOSLAVIA; NEWBORN; INFANTS; CHLORINE; ORGANIC COMPOUNDS; DDD; DDE; DDT; HEXACHLOROCYCLOHEXANE; PESTICIDE RESIDUES; LINDANE; POPULATION EXPOSURE; PREGNANCY Basulic, D.; Stampar-Plasaj, B.; Bujanovic, V.; Stojanovski, N.; Nastev, B.; Rudelic, I.; Sisul, N.; Zuzek, A. 1984 Bulletin of Environmental Contamination and Toxicology 32:265-268				

Ethylene, 1,1-dichloro-2,2-bis(p-chlorophenyl)- (8 CI); Benzene, 1,1'-(dichloroethenylidene)bis(4-chloro- (9 CI)
72-55-9
C14-H8-Cl4
MW 318.02, MP 88.4 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9266 Blood, serum	a) 7 b) 8 c) 9 d) 7	a) Not given b) Not given c) Not given d) Not given	a) 13.51+/-7.87 ppb b) 12.84+/-4.19 ppb c) 13.24+/-9.18 ppb d) 14.63+/-13.03 ppb	a) Controls, normal 2nd trimester pregnancies, no missed abortions b) Low serum PCB, recent missed abortions (mean 1.62) c) High serum PCB, recent missed abortions (mean 1.50) d) Former missed abortions (mean 3.43) In missed abortions, products of conception were retained in utero at least 6 wk after fetal death, which occurred before week 20 of gestation. Women with missed abortions (mean age 28.1 yr for high PCB group) and controls (mean age 24.7 yr) GC

ADULTS; BLOOD SERUM; CHLORINE ORGANIC COMPOUNDS; DDD; DDE; DDT; DIELDRIN; HEPTACHLOR EPOXIDE; INSECTICIDES; LINDANE; PESTICIDES; POLYCHLORINATED BIPHENYLS; BIOACCUMULATION; PESTICIDE RESIDUES; PREGNANCY; ENVIRONMENTAL EXPOSURE

Bercovici, B.; Wassermann, M.; Cucos, S.; Ron, M.; Wassermann, D.; Pines, A. 1983 Environmental Research 30:169-174

Tissue	Cases Exposure Route	Range	Mean	General Information
9267 Milk	16	a) Not given b) Not given c) Not given d) Not given e) Not given f) Not given g) Not given h) Not given	a) 26.6 ng b) 37.0 ng c) 36.5 ng d) 27.7 ng e) 25.7 ng f) 22.4 ng g) 20.8 ng h) 33.8 ng /g whole milk	a) 7 d after parturition b) 14 d c) 28 d d) 42 d e) 56 d f) 70 d g) 84 d H) 98 d Average of samples collected at each time period. No correlation between levels in milk and blood. Accumulation of residue in infant body fat theoretically estimated to increase rapidly during 1st 3 mo of breastfeeding, eventually equal to or greater than adult levels. p,p'-DDE and PCB levels highly correlated (95% confidence level, r = 0.701) Mothers, mean age 35+/-2 yr, mean wt 125+/-8 lb, National Capital Region, (Ottawa), Canada GC

BLOOD; MILK; ENVIRONMENTAL EXPOSURE; CANADA; ADULTS; PESTICIDES; POLYCHLORINATED BIPHENYLS; CHLORINE ORGANIC COMPOUNDS; LACTATION; PESTICIDE RESIDUES; DIELDRIN; DDT; DDE; OXYCHLORDANE; NONACHLOR; HEPTACHLOR EPOXIDE; HEXACHLOROBENZENE; BIOACCUMULATION

Mes, J.; Doyle, J.A.; Adams, B.R.; Davies, D.J.; Turton, D. 1984 Archives of Environmental Contamination and Toxicology 13:217-223

Ethylene, 1,1-dichloro-2,2-bis(p-chlorophenyl)- (8 CI); Benzene, 1,1'-(dichloroethenylidene)bis(4-chloro- (9 CI)
72-55-9
C14-H8-Cl4
MW 318.02, MP 88.4 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9260 Milk	a) 54 b) 102	a) 0.36-5.7 ppm b) 0.24-11.0 ppm	a) 2.0 +or- 1.2 ppm b) 1.9 +or- 1.8 ppm	a) Hawaii b) Mainland USA Sampled up to 1 mo postpartum. Lipid basis. 1979-80 GC
HAWAII; UNITED STATES; ADULTS; MILK; ALDRIN; CHLORINATED HYDROCARBONS; CHLORINE ORGANIC COMPOUNDS; DDD; DDE; DDT; DIELDRIN; HEPTACHLOR EPOXIDE; HEPTACHLOROCYCLOHEXANE; HEXACHLOROBENZENE; LINDANE; NONACHLOR; OXYCHLORDANE; POLYCHLORINATED BIPHENYLS; PESTICIDE RESIDUES; POPULATION EXPOSURE; ENVIRONMENTAL EXPOSURE Tabel, G.H.; Kanahiuna, S.M.; Leong, G.H. 1988 Bulletin of Environmental Contamination and Toxicology 30:606-613				

Tissue	Cases Exposure Route	Range	Mean	General Information
9260 Milk	a) 20 b) 20 c) 20 d) 20 e) 20	a) 0.88-1.70 mg b) 0.84-2.10 mg c) 1.17-2.74 mg d) 1.06-1.84 mg e) 1.15-2.88 mg /kg fat	a) 1.17+/-0.23 mg b) 1.16+/-0.32 mg c) 1.87+/-0.42 mg d) 1.37+/-0.28 mg e) 1.84+/-0.44 mg /kg fat	a) Umea, north coast b) Osterund, middle c) Stockholm, east coast d) Gothenburg, west coast e) Lund, south Range of 18 samples from mothers in each area. Samples pooled, milk collected 3-5 days postpartum. Levels p,p'-DDT + p,p'-DDE in Stockholm, Lund significantly different (p=0.05) from Umea, Osterund. 1977-79, Sweden GC-EC
SWEDEN; MILK; DDE; DDT; DIELDRIN ; HEXACHLOROCYCLOHEXANE; HEXACHLOROBENZENE; POLYCHLORINATED BIPHENYLS; AGRICULTURE; INDUSTRIAL AREAS; LACTATION; PESTICIDE RESIDUES; POPULATION EXPOSURE; ENVIRONMENTAL EXPOSURE Noren, K. 1988 Ambio 12(1):44-46				

Tissue	Cases Exposure Route	Range	Mean	General Information
9270 Milk	8	a) 1.15-1.34 mg/kg b) 0.26-0.30 mg/kg c) 0.71-0.76 mg/kg d) 0.59-0.66 mg/kg	a) 1.19+/-0.043 mg/kg b) 0.36+/-0.025 mg/kg c) 0.73+/-0.017 mg/kg d) Not given	a) Successive fractions, 1 nursing period, mother A b) Successive fractions, 1 nursing period, mother B c) Each nursing period for 24 hr, mother C d) Sample 1X/wk, 4 wk, mother C Fat basis GC
ADULTS; MILK; MEASUREMENT METHODS; PESTICIDES; POLYCHLORINATED BIPHENYLS; LACTATION; HEALTH HAZARDS; ENVIRONMENTAL EXPOSURE Noren, K. 1983 Archives of Environmental Contamination and Toxicology 12:277-283				

Ethylene, 1,1-dichloro-2,2-bis(p-chlorophenyl)- (8 Cl); Benzene, 1,1'-(dichloroethenylidene)bis(4-chloro- (9 Cl)
72-55-9
C14-H8-Cl4
MW 318.02, MP 88.4 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9271 Milk	50 Ingestion	a) 0.005-0.063 mg/kg b) 0.15-2.7 mg/kg	a) 0.030 +or- 0.021 mg/kg b) 0.55 +or- 0.61 mg/kg	a) Milk b) Milk fat (mean of 3.7%) Nonsmokers, 22-35 yr old, ht 152-180 cm, wt 48-90 kg, 1-4 children, Finland. GC/MS

PESTICIDES; ADULTS; MILK; MEASUREMENT METHODS; FINLAND; DDT; DDE; DDD; HEXACHLOROBENZENE; OXYCHLORDANE; POLYCHLORINATED BIPHENYLS; POPULATION EXPOSURE; FOOD CONTAMINATION; WATER POLLUTION; NONACHLOR; ENVIRONMENTAL EXPOSURE
Wickstrom, K.; Pyysalo, H.; Simes, M.S. 1983 Bulletin of Environmental Contamination and Toxicology 31:251-256

Tissue	Cases Exposure Route	Range	Mean	General Information
9272 Milk, fat	a) 57 b) 4	a) 0.24-4.55 mg/kg fat b) 0.82-1.11 mg/kg fat	a) 1.04 mg/kg fat b) 0.97 mg/kg fat	a) Samples from Copenhagen (10), Naestved (8), Odense (11), Bornholm (10), Sonderborg (8), Aalborg (10). Foremilk and hindmilk collected May-Dec 1982, 4-113 days postpartum b) Pools of equal parts from 9 mothers, Copenhagen, Feb 1982 Only Bornholm was significantly higher than lowest value (Sonderborg). Levels similar in individual and pooled samples. No immediate health risk to infants. Mothers with normal, healthy babies, 10 with low wt babies, Denmark GC-EC

MILK; ENVIRONMENTAL EXPOSURE; DENMARK; COMPARATIVE EVALUATIONS; CHLORINATED HYDROCARBONS; CHLORINE ORGANIC COMPOUNDS; CHLOROBENZENES; DDE; DDT; DIELDRIN; HEXACHLOROCYCLOHEXANE; HEXACHLOROBENZENE; POLYCHLORINATED BIPHENYLS
Andersen, J.R.; Orbaek, K. 1984 Ambio 13(4):266-268

Tissue	Cases Exposure Route	Range	Mean	General Information
9275 Placenta	a) 27 b) 9	a) 2.8-98.0 ppb b) 4.7-22.3 ppb	a) 16.3 ppb b) 12.4 ppb	a) Live births b) Stillbirths Pregnant women, Lucknow, India GC-EC; TLC

INDIA; ADULTS; NEWBORN; BLOOD; PLACENTA; ALDRIN; CHLORINE ORGANIC COMPOUNDS; DDD; DDE; DDT; HEXACHLOROCYCLOHEXANE; LINDANE; BIOACCUMULATION; METABOLITES; PESTICIDE RESIDUES; POPULATION EXPOSURE; PREGNANCY; ENVIRONMENTAL EXPOSURE
Saxena, M.C.; Siddiqui, M.K.J.; Agarwal, V.; Kuuty, D. 1983 Journal of Toxicology and Environmental Health 11:71-79

Europium

7440-53-1
Eu
AtW 151.96, MP 822 C (also reported as 826 C), BP 1597 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9274 Lung	a) 1 b) 11 Inhalation	a) Not given b) Not given	a) 87.5 ppb b) 1.2 ppb	a) Exposed worker, biopsy b) Unexposed controls, autopsies 58 yr old photoengraver, exposed to smoke from carbon arc lamp during 46 yr. 20-83 yr old controls. Italy Worker: dyspnea, cough, cyanosis (extremities), crepitant rales, pulmonary fibrosis, hypertension, cardiac hypertrophy and overloading, death from acute cardiorespiratory insufficiency NA
9275 Lymph node	a) 1 b) 11 Inhalation	a) Not given b) Not given	a) 4.8 ppb b) 4.4 ppb	a) Exposed worker, biopsy b) Unexposed controls, autopsies 58 yr old photoengraver, exposed to smoke from carbon arc lamp during 46 yr. 20-83 yr old controls. Italy Worker: dyspnea, cough, cyanosis (extremities), crepitant rales, pulmonary fibrosis, hypertension, cardiac hypertrophy and overloading, death from acute cardiorespiratory insufficiency NA
NEODYMIUM; YTTERBIUM; TERBIUM; EUROPIUM; LUTETIUM; ITALY; ADULTS; AUTOPSIES; CASE HISTORIES; PNEUMOCONIOSIS; LUNGS; LYMPH NODES; BIOPSIES; CERIUM; LANTHANUM; METALS; SAMARIUM; THORIUM; DUST; FUMES; INHALATION; OCCUPATIONAL HAZARDS; PRINTING INDUSTRY; OCCUPATIONAL EXPOSURE Vocaturo, G.; Colombo, F.; Zanoni, M.; Rodi, F.; Sabbioni, E.; Pietra, R. 1983 Chest 83(5):780-783				

Fluoride

16984-48-8
F
AtW 18.9984

Tissue	Cases Exposure Route	Range	Mean	General Information
9276 Bone	a) 6 b) 8 c) 19 d) 22	a) Not given b) Not given c) Not given d) Not given	a) 262+/-127 ug/g b) 519+/-494 ug/g c) 292+/-496 ug/g d) 936+/-626 ug/g Dry wt	a) <=50 yr old, sudden deaths b) <=50 yr old, deaths from chronic diseases c) >50 yr old, sudden deaths d) >50 yr old, deaths from chronic diseases Died suddenly from accident or heart disease, or as result of chronic immobilising diseases. AAS
BONE; ENVIRONMENTAL EXPOSURE; FINLAND; ADULTS; AUTOPSIES; DIABETES; HEART DISEASES; BRONCHITIS; TUBERCULOSIS; CARCINOMAS; NEOPLASMS; FLUORIDE; BIOACCUMULATION; MINERAL DEPOSITS Lappalainen, R.; Knuuttila, M.; Lammi, S.; Alhava, E.M. 1985 Journal of Chronic Diseases 38(10):707-713				

Fluoride
16984-48-8
F
AtW 18.9984

Tissue	Cases Exposure Route	Range	Mean	General Information
9277 Bone	55	a) Not given b) Not given c) Not given d) Not given	a) 262-127 ug/g b) 510-494 ug/g c) 292-488 ug/g d) 938-626 ug/g Dry wt	a) Pre-menopausal women (< or = 50 yrs), sudden death b) Pre-menopausal women (< or = 50 yrs), death from chronic disease c) Past-menopausal women (>50 yrs), sudden death d) Past-menopausal women (>50 yrs), death from heonic diseases Correlations with Zn, Mn, Ca discussed. Autopsies, Finland AAS
PINLAND; AUTOPSIES; BONES; COMPARATIVE EVALUATIONS; FLUORIDE; BIOACCUMULATION; Lappalainen, R.; Knuuttila, M.; Lammi, S.; Alhava, E.M. 1985 Journal of Chronic Diseases 38(10):707-713				

Tissue	Cases Exposure Route	Range	Mean	General Information
9278 Urine	5 Ingestion	3995-6666 ug	4833+/-824 ug	Net urinary excretion, 0-18 hr after ingestion of 10 mg NaF tablet. Corrected for background. Closer relationship between plasma concentration and urinary excretion rate than between the former and urinary concentration of F Healthy volunteers, 55-70 kg, 21-39 yr old, Sweden F ion-sensitive electrode
URINE; BLOOD PLASMA; DELIBERATE EXPOSURE; SWEDEN; ADULTS; MEASUREMENT METHODS; FLUORIDE Ekstrand, J.; Ehrnebon, M. 1983 Journal of Occupational Medicine 25(10):745-748				

Tissue	Cases Exposure Route	Range	Mean	General Information
9279 Urine	5800 Inhalation Ingestion			Review. Levels, by age, sex, and season for subjects residing in unpolluted environments and not occupationally exposed. By age, sex and exposure mode for subjects in high-level areas. Japan. Ion analyzer
URINE; CONSUMER EXPOSURE; ENVIRONMENTAL EXPOSURE; OCCUPATIONAL EXPOSURE; JAPAN; AGE; COMPARATIVE EVALUATIONS; REVIEW; FLUORIDE; INDUSTRIAL CHEMICALS; AIR POLLUTION; DRINKING WATER; FOODS; INDUSTRIAL AREAS; INDUSTRIAL ATMOSPHERES; INDUSTRIAL EMISSIONS; INHALATION; POPULATION EXPOSURE; SMELTERS Tsunoda, H.; Sakurai, S.; Itai, K.; Sato, T.; Nakaya, S.; Mita, M.;Tatsumi, M. 1984 Fluoride 17(3):159-167				

Formaldehyde
50-00-0
C-H2-O
MW 30.03, MP -92 C, BP -19.5 C at 760 mm Hg, VP 10 mm Hg at -88 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9280 Liver				Review. Association between exposure and qualitative liver changes. Possible mechanisms postulated, including direct effects on hepatocytes or indirect effects through circulatory and immune systems.
LIVER; ENVIRONMENTAL EXPOSURE; OCCUPATIONAL EXPOSURE; LIVER DISEASES; REVIEW; ACCIDENTAL POISONING; AIR POLLUTION; HEALTH HAZARDS; INHALATION; OCCUPATIONAL HAZARDS Beall, J.R.; Ulsamer, A.G. 1964 Journal of Toxicology and Environmental Health 13(1):1-21				

Tissue	Cases Exposure Route	Range	Mean	General Information
9281 Liver				Review. Exposure and associated hepatotoxicity, including macroscopic, microscopic, and biochemical manifestations as as possible mechanisms for toxicity discussed.
LIVER; ENVIRONMENTAL EXPOSURE; LIVER DISEASES; REVIEW; AIR POLLUTION; BIOACCUMULATION; HEALTH HAZARDS; OCCUPATIONAL HAZARDS; INHALATION; CARCINOGEN; POPULATION EXPOSURE Beall, J.R.; Ulsamer, A.G. 1964 Journal of Toxicology and Environmental Health 13:1-21				

Formamide, N-methyl-
123-39-7
C2-H5-N-O
MW 59.07, BP 180-185 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9282 Urine	11 Inhalation Dermal	a) Not given b) Not given	a) 8.9+/-2.6 ppm b) 18.3+/-2.3 ppm Geometric means	a) In cold weather, 35-64 F b) In hot weather, 69-96 F After exposure to dimethylformamide. 15% reduction in urine volume in b) correlated with increased levels. Occupationally exposed workers, du Pont GC
ADULTS; URINE ; METABOLITES; INDUSTRIAL PLANTS; OCCUPATIONAL HAZARDS; OCCUPATIONAL EXPOSURE Dixon, S.W.; Graepel, G.J.; Leoney, W.C. 1963 Journal of the American Industrial Hygiene Association 44(4):273-275				

Formic acid
64-18-6
C-H2-O2
MW 46.02, MP 8.4 C, BP 100.5 C, VP 43 mm Hg at 25 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9285 Blood, serum	1 Ingestion	a) Not given b) 31-88 mmol/L c) Not given	a) 28 mmol/L b) Not given c) 16 mmol/L	a) 8 hr after ingestion b) 21-82 hr c) 46 hr Baby given amoxicillin accidently suspended in methanol/water (70/30 by volume). Measured as formate. 8 mo old, Salt Lake City, Utah Flourimetry
BLOOD SERUM; DELIBERATE EXPOSURE; UTAH; INFANTS; METHANOL; ACCIDENTAL POISONING				
Shahangian, S.; Robinson, V.L.; Jennison, T.A. 1984 Clinical Chemistry 30(8):1413-1414				

Tissue	Cases Exposure Route	Range	Mean	General Information
9284 Urine	35 Inhalation	a) Not given b) Not given c) Not given d) Not given e) Not given f) Not given	a) 13.16 mg/L b) 13.55 mg/L c) 11.50 mg/L d) 11.70 mg/L e) 13.96 mg/L f) 16.40 mg/L	a) Week 1, pre-exposure b) Post-exposure 0.04-0.38 ppm (mean 0.11 ppm) c) Week 2, pre-exposure d) Post-exposure 0.02-0.36 ppm (mean 0.11 ppm) e) Week 5, pre-exposure f) Post-exposure 0-0.28 ppm (mean 0.04 ppm) Exposed to 40% formaldehyde for about 2 hr in laboratory class. No significant differences. Freshman veterinary medicine students, Colorado State University, Colorado Headache, sneezing, scratchy throat, forehead rash GC
URINE; ADULTS; COLORADO; ENVIRONMENTAL EXPOSURE; INHALATION; FUMES				
Gottschling, L.M.; Beaulieu, H.J.; Melvin, W.W. 1984 American Industrial Hygiene Association Journal 45(1):19-28				

Glycols, polyethylene, mono(tetrahydrofurfuryl) ether (8 CI); Poly(oxy-1,2-ethanediyl), alpha-((tetrahydro-2-furanyl)methyl)-omega-hydroxy- (9 CI)
31692-85-0
(C2-H4-O)mult-C5-H10-O2

Tissue	Cases Exposure Route	Range	Mean	General Information
9285 Blood, plasma	a) 9 b) 9 Injection	a) 210-12 ug/ml b) 215-13 ug/ml	a) Not given b) Not given	a) 10 min and 8 hr after 4.440 g, in cirrhosis patients b) 10 min and 8 hr after 4.440 g, in controls Given as IV dose, 6 ml containing 250 mg phenacetin. N(sub 2)-glycofurol measured. Clearance reduced and half-time increased in a). Ranges of means, estimated from figure. Adult patients with cirrhosis and liver function impairment, and age-matched controls GC
BLOOD PLASMA; DELIBERATE EXPOSURE; SOLVENTS; METABOLISM				
Bury, R.W.; Breen, K.J.; Desmond, P.V.; Raymond, K.; Mashford, M.L. 1984 Clinical Pharmacology and Therapeutics 36(1):82-84				

Glyoxylic acid, phenyl- (8 CI); Benzeneacetic acid, alpha-oxo- (9 CI)
611-73-4
C8-H6-O3
MW 150.14, MP 66 C, BP 147-151 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9286 Urine	a) 6 b) 4 c) 6 d) 6 Inhalation	a) 107-274 mg/l b) 220-274 mg/l c) 363-885 mg/l d) 214-526 mg/l	a) 183 mg/l b) 251 mg/l c) 526 mg/l d) 334 mg/l	a) Solid waste container workers b) Duckboard workers c) Tank cylinder workers d) Tank finishing workers Mean air levels, 120-684 ul/l Correlation moderate with styrenemia (r=0.5799), good with mandelicuria (r=0.8017). Workers, fiberglass reinforced plastic factory HPLC
BLOOD; URINE; OCCUPATIONAL EXPOSURE; COMPARATIVE EVALUATIONS; STYRENES; AIR POLLUTION; BIOLOGICAL MONITORING; INHALATION; METABOLITES Apostoli, P.; Brugnone, F.; Perbellini, L.; Cocheo, V.; Bellomo, M.L.; Silvestri, R. 1984 American Journal of Industrial Medicine 4:741-754				

Gold
7440-57-5
Au
AtW 196.9665, MP 1064.76 C, BP 2700 C, VP 1 mm Hg at 1660 C, 10 mm Hg at 2160 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9287 Cerebrospinal fluid	a) 10 b) 8 c) 8 d) 6 e) 3 f) 1	a) Not given b) Not given c) Not given d) Not given e) Not given f) Not given g) Not given	a) 38.5+/-8.2 ug/l b) 26.1+/-16.6 ug/l c) 35.3+/-23.7 ug/l d) 23.6+/-3.8 ug/l e) 27.8+/-13.2 ug/l f) 50.5 ug/l g) 16.0 ug/l	a) Controls, non-neoplasmic diseases (hydrocephalus, etc.) b) Meningioma c) Craniopharyngioma d) Astrocytoma e) Medulloblastoma f) Pinealblastoma g) Chondrosarcoma b, c) Benign brain tumors, (d-g) malignant brain tumors No significant differences. Patients, 18 men, 14 women, range of mean ages 4.6-55.0 yr, fasted 8-12 hr AAS
CEREBROSPINAL FLUID; SAUDI ARABIA; CARCINOMAS; NEOPLASMS; SARCOMAS; ALUMINUM; ANTIMONY; BISMUTH; CADMIUM; COPPER; GOLD; LEAD; SELENIUM; SILVER El-Yazigi, A.; Al-Saleh, I.; Al-Mefty, O. 1984 Clinical Chemistry 30:1858-1860				

Tissue	Cases Exposure Route	Range	Mean	General Information
9288 Hair	a) 86 b) 24	a) 0.01-0.62 ppm b) 0.04-0.21 ppm	a) 0.06 ppm b) 0.09 ppm	a) Pottery workers b) Controls Pottery workers from Tlaquepaque and Tonala, Mexico. Controls from Tucson, AZ NA
HAIR; OCCUPATIONAL EXPOSURE; ARIZONA; MEXICO; ADULTS; LEAD; CADMIUM; ARSENIC; VANADIUM; GOLD; ZINC; COPPER; IRON; MANGANESE; POTASSIUM Weber, C.W.; Nelson, G.W.; deVaquera, M.V.; Pearson, P.B. 1984 Nutrition Reports International 30(5):1009-1018				

Gold

7440-57-5
Au
AtW 196.9665, MP 1064.76 C, BP 2700 C, VP 1 mm Hg at 1660 C, 10 mm Hg at 2160 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9280 Hair	a) 48 b) 55 c) 28 d) 21	a) 1-270 ug/kg b) 1-80 ug/kg c) 1-84 ug/kg d) 1-72 ug/kg	a) 4 ug/kg b) 6 ug/kg c) 6 ug/kg d) 8 ug/kg	a) Caucasian boys b) Caucasian girls c) Hindustani children d) Creal, Chinese, and Javanese subjects, migrated from Surinam 5 g scalp hair from occipital region. 8 yr old school children living in Amsterdam suburb NA; AAS
HAIR; ENVIRONMENTAL EXPOSURE; NETHERLANDS; CHILDREN; SEX; BIOACCUMULATION; BIOLOGICAL MONITORING; DIETS; COPPER; ZINC; LEAD; IRON; CADMIUM; SELENIUM; COBALT; SILVER; GOLD Herber, R.F.M.; Wibowo, A.A.E.; Das, H.A.; Egger, R.J.; van Deych, W.; Zielhuis, R.L. 1983 International Archives of Occupational and Environmental Health 53:127-137				

Hexachlorocyclohexane, total (No postings in CHEMLINE).

Tissue	Cases Exposure Route	Range	Mean	General Information
9290 Adipose	15	170-700 ug/kg	270 ug/kg	Investigation of residues in autopsy samples. Fat basis. Sum of alpha-, beta-, gamma-hexachlorocyclohexane isomers. 20-60 yr old traffic accident victims, 1970-80. Ljubljana and Maribor hospitals, Yugoslavia GLC
9291 Milk, fat	12	Not given	250 ug/kg	3-5 days postpartum. Sum of alpha-, beta-, gamma-hexachlorocyclohexane isomers. 9-10/81. Mothers in Ljubljana Maternity Clinic, Yugoslavia GLC
9292 Milk, whole	12	5-15 ug/kg	9.7 ug/kg	3-5 days postpartum. Sum of alpha-, beta-, gamma-hexachlorocyclohexane isomers. 9-10/81. Mothers in Ljubljana Maternity Clinic, Yugoslavia GLC
ADIPOSE TISSUE; MILK; ENVIRONMENTAL EXPOSURE; YUGOSLAVIA; AUTOPSIES; CHLOROBENZENES; HEXACHLOROCYCLOHEXANE; BIOACCUMULATION; LACTATION; PESTICIDE RESIDUES; METABOLISM; Jan, J. 1983 Bulletin of Environmental Contamination and Toxicology 30:595-599				

Iodide
20461-54-5
I
AtW 127.9

Tissue	Cases Exposure Route	Range	Mean	General Information
9298 Milk	57 Ingestion	a) 20-490 ug/l b) Not given c) Not given d) Not given	a) 178 ug/l b) 118+/-64 ug/l c) 143+/-106 ug/l d) 270+/-146 ug/l	a) Mature milk, initial samples, all mothers b) Consumed non-iodized salt, 6 mothers c) Low intake of iodized salt, 10 mothers d) High intake of iodized salt, 11 mothers Significant differences between b) and d), c) and d) Mothers, ages 21-36 yr ISE
MILK; DELIBERATE EXPOSURE; NORTH CAROLINA; INFANTS; COMPARATIVE EVALUATIONS; IODIDE; DIETS; FOOD ADDITIVES *Gushurst, C.A.; Mueller, J.A.; Green, J.A.; Sedor, F.* 1984 Pediatrics 73(5):554-557				

Iodine
7553-56-2
I
AtW 126.9045, MP 113.60 C, BP 185.24 C, VP (solid) 0.08 mm Hg at 0 C, 0.305 mm Hg at 25 C, 2.154 mm Hg at 50 C, 26.78 mm Hg at 90 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9294 Blood, plasma		a) Not given b) Not given c) Not given	a) 0.029+/-0.003 ug/mL b) 0.039+/-0.007 ug/mL c) 0.032+/-0.006 ug/mL	a) Insulin-treated diabetics b) Non-insulin-treated diabetics c) Control non-diabetics Collected after overnight fasting. Significant differences among all groups. 18-78 yr olds, Oxford, England NA; AAS
BLOOD PLASMA; ENGLAND; DIABETES; METABOLISM; MINERAL METABOLISM; ALUMINUM; ANTIMONY; ARSENIC; BARIUM; BROMINE; CADMIUM; CALCIUM; CESIUM; CHROMIUM; COBALT; COPPER; IODINE; IRON; LEAD; MAGNESIUM; MANGANESE; MERCURY; MOLYBDENUM; NICKEL; RUBIDIUM; SCANDIUM; SELENIUM; SILVER; TIN; VANADIUM; ZINC Ward, N.I.; Pim, B. 1984 Biological Trace Element Research 6:469-487				

Tissue	Cases Exposure Route	Range	Mean	General Information
9295 Hair	6	a) 0.2-2.8 ug/g b) 0.2-3.5 ug/g c) 0-3.5 ug/g d) 0.4-3.5 ug/g e) 0-5 ug/g f) 0-3.4 ug/g Estimated from figure	a) 0.85 ug/g b) 0.87 ug/g c) 0.81 ug/g d) 1.6 ug/g e) 3.1 ug/g f) 0.25 ug/g	a) 0-40 cm from scalp, 7 yr old female b) 0-40 cm from scalp, 4 yr old female c) 0-30 cm from scalp, 7 yr old female d) 0-18 cm from scalp, 3 yr old female e) 0-16 cm from scalp, 2 yr old male f) 0-45 cm from scalp, 40 yr old female Range from total length, mean from 1st 10 cm from scalp. Levels increased from scalp to tip. Japan I
HAIR; ENVIRONMENTAL EXPOSURE; JAPAN; ADULTS; CHILDREN; COMPARATIVE EVALUATIONS; BROMINE; CALCIUM; CHLORINE; COPPER; IODINE; MAGNESIUM; MANGANESE; MERCURY; SELENIUM; ZINC; BIOINDICATORS Yukawa, M.; Suzuki-Yasumoto, M.; Tanaka, S. 1984 Science of the Total Environment 36:41-54				

Iodine
7553-56-2
I
AtW 126.9045, MP 113.60 C, BP 185.24 C, VP (solid) 0.08 mm Hg at 0 C, 0.806 mm Hg at 25 C, 2.154 mm Hg at 50 C, 26.78 mm Hg at 90 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9206 Milk	a) 10 b) 16 c) 7	a) 170-510 ug/kg b) 182-460 ug/kg c) 157-1560 ug/kg Dry wt	a) 319+/-113 ug/kg b) 276+/-86 ug/kg c) 660+/-628 ug/kg Dry wt	a) Colostrum (1st or 2nd day post partum) b) Transitional milk (3-6 days post partum) c) Mature milk (1-6 mo post partum) Slovenia, Yugoslavia HA
MILK; ARSENIC; CADMIUM; COBALT; COPPER; MERCURY; IODINE; MANGANESE; ANTIMONY; SELENIUM; VANADIUM; ZINC; YUGOSLAVIA; ENVIRONMENTAL EXPOSURE Kosta, L.; Byrne, A.R.; Dermelj, M. 1983 Science of the Total Environment 29:261-268				

Tissue	Cases Exposure Route	Range	Mean	General Information
9207 Urine	32 Ingestion	a) Not given b) Not given c) Not given d) Not given e) Not given f) Not given	a) 222+/-19 ug b) 222+/-27 ug c) 185+/-11 ug d) 159+/-58 ug e) 174+/-52 ug f) 142+/-33 ug /g creatinine S.E.	a) Nonsmokers, initial level, 27 subjects b) 4 wk c) 12 wk d) Smokers (1-20 cigarettes/d), initial level, 5 subjects e) 4 wk f) 12 wk 6 mg thiocyanate daily from milk with 20 mg/l. Normal levels 84-168 ug/g creatinine. Healthy volunteers, Uppsala, Sweden
BLOOD SERUM; URINE; DELIBERATE EXPOSURE; CONSUMER EXPOSURE; SWEDEN; ADULTS; THIOCYANATES; FOOD ADDITIVES Dahlberg, P.-A.; Bergmark, A.; Bjorck, L.; Bruce, A.; Hambraeus, L.; Claesson, O. 1984 American Journal of Clinical Nutrition 39:416-420				

Iron
7439-89-6
Fe
AtW 55.847, MP 1535 C (pure), 1000-1300 C (cast), 1500 C (wrought), 1300 C (steel), BP 3000 C, VP 1 mm Hg at 1767 C, 10 mm Hg at 2040 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9208 Aorta	a) 8 b) 6 c) 7	a) 140-250 ppm b) 120-300 ppm c) Not given Dry wt	a) Not given b) Not given c) 110+/-51 ppm Dry wt	a) Sclerotic aorta from metal-workers b) Normal aorta from metal-workers c) Normal aorta from non metal-workers 45-66 yr old workers. Autopsies, Japan, 1976-1977. Employed 7-32 yr ES
AORTA; VERTEBRAE; BONES; ENVIRONMENTAL EXPOSURE; OCCUPATIONAL EXPOSURE; JAPAN; AUTOPSIES; CADAVERS; CARDIOVASCULAR DISEASES; MINERALS; BIOACCUMULATION; DIETS; FOODS; MINERAL DEPOSITS; CALCIUM; PHOSPHORUS; IRON; MAGNESIUM; ZINC; ALUMINUM; COPPER; CADMIUM; LEAD; NICKEL; VANADIUM; CHROMIUM; MANGANESE; SILICON; TIN; TITANIUM; STRONTIUM Teraoka, H. 1984 Archives of Environmental Contamination and Toxicology 13:119-127				

Iron
7439-89-6
Fe
AtW 55.847, MP 1535 C (pure), 1000-1300 C (cast), 1500 C (wrought), 1300 C (steel), BP 3000 C, VP 1 mm Hg at 1787 C, 10 mm Hg at 2040 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9299 Blood	231	a) 167-573 ppm b) 119-936 ppm	a) 324+/-102 ppm b) 392+/-166 ppm	a) Maternal, 66 cases b) Cord, 65 cases Significant positive correlation. Determinations in 1977, 1978. Nagoya, Japan, 1974-1978. Maternal venous and umbilical cord blood. Normal deliveries. AAS
ZINC; MERCURY; METHYLMERCURY; LEAD; CADMIUM; MANGANESE; COPPER; IRON; JAPAN; BLOOD; PLACENTA; UMBILICAL CORD; METALS; ENVIRONMENTAL EXPOSURE Tsuchiya, H.; Mitani, K.; Kodama, K.; Nakata, T. 1984 Archives of Environmental Health 39(1):11-17				

Tissue	Cases Exposure Route	Range	Mean	General Information
9300 Blood	112 Ingestion	a) Not given b) Not given c) Not given d) Not given e) Not given f) Not given	a) 5.5+/-1.6% b) 11.3+/-1.2% c) 21.8+/-1.2% d) 6.5+/-1.6% e) 19.0+/-1.8% f) 8.0+/-1.2% S.E.	a) Black beans containing 3 mg Fe plus 533 mg capsule reduced glutathione (beans alone, 2.2%) b) Black beans containing 3 mg Fe, cooked with 533 mg reduced glutathione (beans alone, 4.5%) c) Hemoglobin containing 3 mg Fe plus 1600 mg reduced glutathione (hemoglobin alone, 15.5%) d) Corn containing 3 mg Fe plus 1050 mg capsule cysteine (corn alone or plus 210 or 630 mg cysteine was 2.5, 4.6, 6.0%) e) Corn containing 3 mg Fe plus 2260 mg capsule glutathione (corn alone or plus 452 or 1356 mg glutathione was 4.0, 6.8, 7.5%) f) Corn containing 3 mg Fe plus 300 g meat (corn alone or plus 100 or 200 g meat was 3.3, 6.0, 6.7%) % Fe absorbed from food. No significant enhancement with smaller doses of cysteine, glutathione or beef and no enhancement with histidine Rural apparently healthy Venezuelans, 39 men, 74 women ES
BLOOD; DELIBERATE EXPOSURE; VENEZUELA; COMPARATIVE EVALUATIONS; IRON; DIETS Layrisse, M.; Martinez-Torres, C.; Leets, I.; Taylor, P.; Ramirez, J. 1984 Journal of Nutrition 14:217-228				

Tissue	Cases Exposure Route	Range	Mean	General Information
9301 Blood, plasma		a) Not given b) Not given c) Not given	a) 1.13+/-0.10 ug/mL b) 1.43+/-0.42 ug/mL c) 1.27+/-0.06 ug/mL	a) Insulin-treated diabetics b) Non-insulin-treated diabetics c) Control non-diabetics Collected after overnight fasting. Significant differences among all groups. 18-78 yr olds, Oxford, England NA; AAS
BLOOD PLASMA; ENGLAND; DIABETES; METABOLISM; MINERAL METABOLISM; ALUMINUM; ANTIMONY; ARSENIC; BARIUM; BROMINE; CADMIUM; CALCIUM; CESIUM; CHROMIUM; COBALT; COPPER; IODINE; IRON; LEAD; MAGNESIUM; MANGANESE; MERCURY; MOLYBDENUM; NICKEL; RUBIDIUM; SCANDIUM; SELENIUM; SILVER; TIN; VANADIUM; ZINC Ward, N.I.; Pim, B. 1984 Biological Trace Element Research 6:469-487				

Iron
7439-89-6
Fe
AtW 55.847, MP 1535 C (pure), 1000-1300 C (cast), 1500 C (wrought), 1300 C (steel), BP 3000 C, VP 1 mm Hg at 1787 C, 10 mm Hg at 2040 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9302 Blood, serum	23 Ingestion	14-35 umol/l	20 umol/l	Subjects in good iron balance. Highly significant inverse correlation between body iron stores and cadmium absorption and retention. Healthy, elderly nonsmokers, 11 males, 12 females, age 60-85, England AAS
BLOOD SERUM; URINE; ENGLAND; CADMIUM; IRON; LEAD; DIETS; AGE; ENVIRONMENTAL EXPOSURE				
Bunker, V.W.; Lawson, M.S.; Delves, H.T.; Clayton, B.E. 1984 American Journal of Clinical Nutrition 39:803-806				

Tissue	Cases Exposure Route	Range	Mean	General Information
9303 Blood, serum	103	0.8-3.7 ug/mL	1.65+/-0.55 ug/ml	Technique developed for simultaneous determination of several elements. Also measured detection limits for other elements. x-ray fluores
MEASUREMENT METHODS; BLOOD SERUM; IRON;COPPER; ZINC; BROMINE; TRACE ELEMENTS				
Rastegar, F.; Maier, E.A.; Heimburger, R.; Christophe, C.; Ruch, C.; Leroy, M.J. 1984 Clinical Chemistry 30(8):1300-1303				

Tissue	Cases Exposure Route	Range	Mean	General Information
9304 Blood, serum	188	a) Not given b) Not given c) 1330+/-67-1356+/-57 ug/L d) Not given S.E.	a) 1215+/-45 ug/L b) 1091+/-34 ug/L c) Not given d) 1.36 ug/L S.E.	a) 30 controls b) 56 patients with myocardial infarctions c) 108 others, range of means d) Patients in b) 21-30 hr after last chest pains Significant differences between a) and b), d) vs initial levels. d) estimated from graph Controls from 30-56 yr olds, 24% with family history of ischemia. 58 yr olds with infarctions, 48 males, 8 females, 64% smokers, 32% family history of ischemia. Others - different diseases, hypertension Colorimetry
BLOOD SERUM; HEART DISEASES; HYPERTENSION; TRACE ELEMENTS; COPPER; ZINC; IRON; NICKEL; COBALT; SODIUM; POTASSIUM; CALCIUM; MAGNESIUM; PAKISTAN; COMPARATIVE EVALUATIONS; CHOLESTEROLS				
Khan, S.N.; Rahman, M.A.; Samad, A. 1984 Clinical Chemistry 30(5):644-646				

Iron
7439-89-6
Fe
AtW 55.847, MP 1535 C (pure), 1000-1300 C (cast), 1500 C (wrought), 1300 C (steel), BP 3000 C, VP 1 mm Hg at 1757 C, 10 mm Hg at 2040 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9505 Body	12 Ingestion	a) 16.41-59.97 b) 7.79-35.20 c) 1.86-2.77 d) 2.61-4.86 % retention	a) 30.28+/-16.91 b) 16.80+/-9.80 c) 2.27+/-0.357 d) 3.50+/-0.726 % retention	i) Fe-55, 6 subjects, 3 fed Fe-59 labelled ferric tripolyphosphate (=3 mg Fe), d 1 and Fe-55 labelled ferrous ascorbate (=3 mg Fe) d 2. 3 fed same in reverse order b) Fe-59, 6 subjects, same regimen c) Fe-55, 6 subjects fed lunch 3 successive days, 3 fed supplemented wheat chapathi (1% TPP and 5 uCi Fe-59), d 1 and unsupplemented wheat chapathi (10uCi Fe-55), d 2. 3 fed same in reverse order d) Fe-59, 6 subjects, same regimen Fasted overnight before dose. 1.58 X higher Fe absorption with 1% TPP added to wheat chapathi Healthy male volunteers, normal hemoglobin levels (14.2-18.7 d/l), India

BODY; DELIBERATE EXPOSURE; INDIA; ADULTS; IRON; FOOD ADDITIVES; WHEAT; COMPARATIVE EVALUATIONS

Rao, K.S.; Rao, B.S.N. 1984 Nutrition Reports International 29(5) 1101-1106

Tissue	Cases Exposure Route	Range	Mean	General Information
9506 Bone	4	46-736 ug/g	377 ug/g	Bulk analysis 37-62 yr old dialysis patients with osteomalacia. Treated 0-96 mo. AAS

ALUMINUM; BLOOD SERUM; BLOOD; LIVER; IRON; BONE; DRUGS

Verbueken, A.H.; Van de Vyver, F.L.; Van Grieken, R.E.; Paulus, G.J.; Visser, W.J.; D'Haese, P.; De Broe, M.E. 1984 Clinical Chemistry 30(5):763-768

Tissue	Cases Exposure Route	Range	Mean	General Information
9507 Bone	1	Not given	390+/-160 ppm Dry wt	Lumbar vertebrae (n=5). Chromate plating worker, employed 7 yr, died at age 66, 30 yr after changing jobs ES

AORTA; VERTEBRAE; BONES; ENVIRONMENTAL EXPOSURE; OCCUPATIONAL EXPOSURE; JAPAN; AUTOPSIES; CADAVERS; CARDIOVASCULAR DISEASES; MINERALS; BIOACCUMULATION; DIETS; FOODS; MINERAL DEPOSITS; CALCIUM; PHOSPHORUS; IRON; MAGNESIUM; ZINC; ALUMINUM; COPPER; CADMIUM; LEAD; NICKEL; VANADIUM; CHROMIUM; MANGANESE; SILICON; TIN; TITANIUM; STRONTIUM

Tereoka, H. 1984 Archives of Environmental Contamination and Toxicology 13:119-127

Iron
7439-89-6
Fe
AtW 55.847, MP 1538 C (pure), 1000-1300 C (cast), 1500 C (wrought), 1300 C (steel), BP 3000 C, VP 1 mm Hg at 1787 C, 10 mm Hg at 2040 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9808 Brain		a) Not applicable b) Not given	a) 10.5X10(E-4)g b) 8.26+/-0.5X10(E-4)g /g Dry wt	a) Samples from caudate nucleus of endogeneous psychosis patients b) Normals Tissue samples dissected 20-24 hr after death. 79 yrs old NA
BRAIN; AUTOPSIES; CASE HISTORIES; BEHAVIOR DISORDERS; COBALT; IRON; RUBIDIUM; ALCOHOLIC BEVERAGES; SELENIUM; ZINC Demmel, U.; Hock, A.; Feinendegen, L.E.; Sebek, P. 1984 Science of the Total Environment 38:69-77				

Tissue	Cases Exposure Route	Range	Mean	General Information
9800 Breast	22	a) Not given b) Not given	a) 218.4+/-149.3 ug/g b) 238.8+/-113.0 ug/g	a) Normal tissue b) Neoplastic Dry wt, 3 samples, p=0.80 Patients with primary breast carcinomas, samples of normal and neoplastic tissue obtained at time of mastectomy X-ray fluorescence
BREAST; CALCIUM; VANADIUM; CHROMIUM; MANGANESE; IRON; NICKEL; COPPER; ZINC; ARSENIC; SELENIUM; BROMINE; RUBIDIUM; STRONTIUM; MOLYBDENUM; LEAD; MERCURY; NEOPLASMS Rink, S.L.; Sky-Peck, H.H. 1984 Cancer Research 44:5890-5894				

Tissue	Cases Exposure Route	Range	Mean	General Information
9810 Hair	a) 176 b) 24	a) 0.2-161 ppm b) 4-26 ppm	a) 23.6 ppm b) 8.9 ppm	a) Pottery workers b) Controls Pottery workers from Tlaquepaque and Tonala, Mexico. Controls from Tucson, AZ AAS
HAIR; OCCUPATIONAL EXPOSURE; ARIZONA; MEXICO; ADULTS; LEAD; CADMIUM; ARSENIC; VANADIUM; GOLD; ZINC; COPPER; IRON; MANGANESE; POTASSIUM Weber, C.W.; Nelson, G.W.; deVaquera, M.V.; Pearson, P.B. 1984 Nutrition Reports International 30(5):1009-1018				

Iron
7439-89-6
Fe
AtW 55.847, MP 1535 C (pure), 1000-1300 C (cast), 1500 C (wrought), 1300 C (steel), BP 3000 C, VP 1 mm Hg at 1787 C, 10 mm Hg at 2040 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9811 Hair	a) 45 b) 54 c) 26 d) 19	a) 4.0-270 mg/kg b) 2.5-110 mg/kg c) 1.9-55 mg/kg d) 4.6-120 mg/kg	a) 31.88 mg/kg b) 19.0 mg/kg c) 12.15 mg/kg d) 14.00 mg/kg	a) Caucasian boys b) Caucasian girls c) Hindustani children d) Creal, Chinese, and Javanese subjects, migrated from Surinam 5 g scalp hair from occipital region. 8 yr old school children living in Amsterdam suburb NA; AAS

HAIR; ENVIRONMENTAL EXPOSURE; NETHERLANDS; CHILDREN; SEX; BIOACCUMULATION; BIOLOGICAL MONITORING; DIETS; COPPER; ZINC; LEAD; IRON; CADMIUM; SELENIUM; COBALT; SILVER; GOLD
Herber, R.F.M.; Wibowo, A.A.E.; Das, H.A.; Egger, R.J.; van Deyck, W.; Zielhuis, R.L. 1983 International Archives of Occupational and Environmental Health 53:127-137

Tissue	Cases Exposure Route	Range	Mean	General Information
9812 Hair	a) 4 b) 6 c) 5 d) 11 e) 10	a) 92-212 ppm b) 102-466 ppm c) 84-290 ppm d) 120-700 ppm e) 88-421 ppm	a) 133 ppm b) 209 ppm c) 160 ppm d) 261 ppm e) 169 ppm	a) 1-15 yr olds, rural b) 15-25 yr olds, rural c) 25 yr olds, rural d) 15-25 yr olds, different areas of country e) All age groups, different areas of country 15-25 yr olds had highest levels of trace elements. Residents of Sri Lanka AAS

HAIR; ENVIRONMENTAL EXPOSURE; SRI LANKA; CHILDREN; ADULTS; LEAD POISONING; METAL POISONING; CALCIUM; MAGNESIUM; IRON; MANGANESE; COPPER; ZINC; LEAD; AUTOMOTIVE; AIR POLLUTION; BIOACCUMULATION; HEALTH HAZARDS; LAND POLLUTION; POPULATION EXPOSURE; RURAL AREAS; URBAN AREAS; AGE
Dissanayake, C.B.; Senaratne, A.; Weerasooriya, S.V.R. 1984 Journal of Environmental Studies 23:41-48

Tissue	Cases Exposure Route	Range	Mean	General Information
9813 Hair	a) 67 b) 51 c) 5 d) 11	a) Not given b) Not given c) Not given d) Not given	a) 757 (3.8) ug/g b) 1159 (2.2) ug/g c) 324 (2.3) ug/g d) 155 (3.8) ug/g	a) Total, unwashed hair samples b) Hair pieces c) Needle-pads d) Others (undefined) In unwashed samples, significant difference between sample types ($p<0.001$), levels higher ($p<0.001$) in samples from 1880-1949 then from 1950-1969. After washing (non-ionic SAA), levels significantly higher in 1911-1968 samples than in 1981-1983. Japanese women. 1981-1983 samples from 22 workers at National Institute of Environmental Studies Atomic emission spectrometry; AAS

HAIR; ENVIRONMENTAL EXPOSURE; JAPAN; COMPARATIVE EVALUATIONS; CALCIUM; COPPER; IRON; LEAD; MAGNESIUM; MANGANESE; MERCURY; MERCURY ORGANIC COMPOUNDS; METALS; MINERALS; PHOSPHORUS; POTASSIUM; SODIUM; STRONTIUM; TRACE ELEMENTS; ZINC; OCCUPATIONAL EXPOSURE
Suzuki, T.; Hongo, T.; Morita, M.; Yamamoto, R. 1984 Science of the Total Environment 39:81-91

Iron
7439-89-6
Fe
AtW 55.847, MP 1535 C (pure), 1000-1300 C (cast), 1500 C (wrought), 1300 C (steel), BP 3000 C, VP 1 mm Hg at 1787 C, 10 mm Hg at 2040 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9314 Liver	1	Not applicable	6520 ug/g Wet wt	Bulk analysis 37 yr old dialysis patient with osteomalacia. Treated 72 mo. AAS
ALUMINUM; BLOOD SERUM; BLOOD; LIVER; IRON; BONE; DRUGS Verbueken, A.H.; Van de Vyver, F.L.; Van Grieken, R.E.; Paulus, G.J.; Visser, W.J.; D'Haese, P.; De Broe, M.E. 1984 Clinical Chemistry 30(5):762-766				

Tissue	Cases Exposure Route	Range	Mean	General Information
9315 Placenta	231	44-132 ppm	77+/-20 ppm	79 cases Nagoya, Japan, 1976-1978. Normal deliveries. AAS
9316 Umbilical cord	231	10-120 ppm	45+/-20 ppm	78 cases Nagoya, Japan, 1976-1978. Normal deliveries. AAS
ZINC; MERCURY; METHYLMERCURY; LEAD; CADMIUM; MANGANESE; COPPER; IRON; JAPAN; BLOOD; PLACENTA; UMBILICAL CORD; METALS; ENVIRONMENTAL EXPOSURE Tsuchiya, H.; Mitani, K.; Kodama, K.; Nakata, T. 1984 Archives of Environmental Health 39(1):11-17				

Tissue	Cases Exposure Route	Range	Mean	General Information
9317 Urine	9 Ingestion	a) Not given b) Not given c) Not given	a) 0.35+/-0.02 mg/kg b) 0.36+/-0.01 mg/kg c) 0.37+/-0.01mg/kg S.E.	a) Uncured b) cured, 40mg/kg nitrite c) Cured, 47 mg/kg nitrite + 200 mg/kg erythorbate 200 g/day cured or uncured sausage. 3 subjects/group, each set rotating to next group every 17 d. Pooled samples from day 6-15. Healthy, 21-27 yr old. Mean ht 180 cm, mean wt 76 kg AAS
BIOAVAILABILITY; IRON; ZINC; COPPER; DELIBERATE EXPOSURE; METABOLISM; URINE; BLOOD SERUM; UNITED STATES Greger, J.L.; Lee, K.; Graham, K.L.; Chinn, B.L.; Liebert, J.C. 1984 Journal of Agricultural and Food Chemistry 32:861-865				

Iron oxide [Fe2O3]
1309-37-1
Fe2-O3
MW 159.70, MP 1565 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9818 Bronchial secretion	8 Inhalation	a) 100-23% b) 100-30% c) 100-30%	a) Not applicable b) Not applicable c) Not applicable	a) Controls b) 108 ug H2-S-04/cu m c) 983 ug H2-S-04/cu m 0-180 min, % tracheobronchial retention of 4.2 um ferric oxide particles after 1 hr exposure to submicrometer sulfuric acid aerosol. Healthy volunteers, 4 females, 4 males, 25-50 yr old, ht 169+/-14 cm, wt 73+/-26 kg. Scintillation counting
BRONCHIAL SECRETIONS; DELIBERATE EXPOSURE; ADULTS; RESPIRATORY DISEASES; IRON; TECHNETIUM; BIOACCUMULATION; INHALATION; PARTICULATES; RADIONUCLIDES Leikauf, G.D.; Spektor, D.M.; Albert, R.E.; Lippmann, M. 1984 American Industrial Hygiene Association Journal 45(5):285-292				

Isopropyl alcohol (8 CI); 2-Propanol (9 CI)
67-63-0
C3-H8-O
MW 60.09, MP -88.5 to -89.5 C,BP 80.3 C, VP 10 mm Hg at 2.4 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9819 Blood	8	1-29 mg/dL	Not given	Autopsies. Deaths not related to isopropanol exposure. 5 cases were diabetic or alcoholic, 2 were severly dehydrated, and 1 had fatal heart attack. GC
9820 Brain	7	2-12 mg/100 g	Not given	Autopsies. Deaths not related to isopropanol exposure. 5 cases were diabetic or alcoholic, 2 were severly dehydrated, and 1 had fatal heart attack. GC
9821 Kidney	8	6-26 mg/dL	Not given	Autopsies. Deaths unrelated to isopropanol exposure. 5 cases were diabetic or alcoholic, 2 were severely dehydrated, 1 had fatal heart attack. GC
9822 Liver	8	7-59 mg/100 g	Not given	Autopsies. Deaths not related to isopropanol exposure. 5 cases were diabetic or alcoholic, 2 were severly dehydrated, and 1 had fatal heart attack. GC
BLOOD; BRAIN; LIVER; KIDNEYS; AUTOPSIES; ALCOHOLS Davis, P.L.; Dal Cortivo, L.A.; Mature, J. 1984 Journal of Analytical Toxicology 8:209-212				

L-Ascorbic acid
50-81-7
C6-H8-O6
MW 176.12, MP 190-192 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9323 Blood, cells	a) 6 b) 11 c) 6 Ingestion	a) 39.9-44.1 mcg b) 22.9-43.3 mcg c) 22.6-48.2 mcg /10(E-8) cells	a) 30.0+/-3.5 mcg b) 30.1+/-2.0 mcg c) 36.7+/-3.8 mcg /10 (E-8) cells S.E.	a) No Vitamin C supplement b) On supplement of 1-3 g/d Vitamin C c) On supplement of 8-12 g/d Vitamin C Lymphocytes. Wide individual variations, unrelated to sex differences. Healthy 27-62 yr old non-smokers
BLOOD PLASMA; LYMPHOCYTES; DELIBERATE EXPOSURE; VITAMIN C Yew, M.-L.S. 1984 Nutrition Reports International 30(3):597-601				

Tissue	Cases Exposure Route	Range	Mean	General Information
9324 Blood, plasma	Ingestion	a) 0.86+/-0.39-1.08+/-0.47 mg b) 1.25+/-0.25-1.61+/- 0.28 mg c) 1.02+/-0.30-1.55+/-0.21 mg /100 ml	a) Not given b) Not given c) Not given	a) Mothers, peak at 12 mo during 0-12 mo breastfeeding b) Breast-fed infants, peak at 9 mo c) Control infants, weaned before 3.5 mo Peak at 6 mo. Supplemented formula and solid foods Range of means. Well-nourished mothers and their newborns delivered at Helsinki University Central Hospital Microfluorometry
BLOOD SERUM; MILK; CONSUMER EXPOSURE; INFANTS; COMPARATIVE EVALUATIONS; VITAMIN C; DIETS; LACTATION; FINLAND Salmenpera, L. 1984 American Journal of Clinical Nutrition 40:1050-1056				

Tissue	Cases Exposure Route	Range	Mean	General Information
9325 Blood, plasma	a) 6 b) 11 c) 6 Ingestion	a) 0.79-1.10 mg/dl b) 0.93-2.71 mg/dl c) 1.29-2.67 mg/dl	a) 0.90+/-0.06 mg/dl b) 1.54+0.16 mg/dl c) 1.96+/-0.20 mg/dl S.E.	a) No Vitamin C supplement b) On supplement of 1-3 g/d Vitamin C c) On supplement of 8-12 g/d Vitamin C Levels reflect supplementary intakes. Healthy 27-62 yr old non-smokers
BLOOD PLASMA; LYMPHOCYTES; DELIBERATE EXPOSURE; VITAMIN C Yew, M.-L.S. 1984 Nutrition Reports International 30(3):597-601				

Tissue	Cases Exposure Route	Range	Mean	General Information
9326 Milk	Ingestion	4.14+/-1.13-6.18+/-0.99 mg/100 ml	Not given	3 d-12 mo postpartum, peak at 3 d. Higher levels than in plasma or in infant's plasma. Well-nourished mothers of infants delivered at Helsinki University Central Hospital Microfluorometry
BLOOD SERUM; MILK; CONSUMER EXPOSURE; INFANTS; COMPARATIVE EVALUATIONS; VITAMIN C; DIETS; LACTATION; FINLAND Salmenpera, L. 1984 American Journal of Clinical Nutrition 40:1050-1056				

L-threo-2,3-Hexodiulosonic acid, gamma-lactone
490-83-5
C6-H6-O6
MW 174.11, MP 225 C (decomp)

Tissue	Cases Exposure Route	Range	Mean	General Information
9827 Blood, cells	a) 6 b) 11 c) 6 Ingestion	a) 0-4.0 b) 0-2.9 c) 0-7.5 mcg/10(E-8) cells	a) 1.3+/-0.7 b) 1.2+/-0.4 c) 1.7+/-1.3 mcg/10(E-8) cells S.E.	a) No Vitamin C supplement b) On supplement of 1-3 g/d Vitamin C c) On supplement of 8-12 g/d Vitamin C Lymphocytes. 27-62 yr old healthy non-smokers
9828 Blood, plasma	a) 6 b) 11 c) 6 Ingestion	a) 0.03-0.08 mg/dl b) 0-0.26 mg/dl c) 0-0.25 mg/dl	a) 0.06+/-0.01 mg/dl b) 0.10+/-0.03 mg/dl c) 0.10+/-0.03 mg/dl S.E.	a) No Vitamin C supplement b) On supplement of 1-3 g/d Vitamin C c) On supplement of 8-12 g/d Vitamin C No significant differences. Addition of citrus bioflavinoids, also studied in b), did not significantly reduce levels. Healthy 27-62 yr old non-smokers
BLOOD PLASMA; LYMPHOCYTES; DELIBERATE EXPOSURE; VITAMIN C Yew, M.-L.S. 1984 Nutrition Reports International 30(3):597-601				

Lanthanum
7439-91-0
La
AtW 138.906, MP 920 C, BP 3454 C, VP 3250 mm Hg at 400 C, 3420 mm Hg at 760 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9829 Kidney	28	a) Not given b) Not given c) Not given d) Not given e) Not given	a) 0.2 ug/kg b) 0.2 ug/kg c) 34.5 ug/kg d) 0.2 ug/kg e) 0.1 ug/kg Medians, wet wt	a) Smelter workers, 10 with malignancies (33% of deaths): mean exposure 31.2 yr, mean length of retirement 8 yr b) 8 with cardiovascular disease (45% of deaths): mean exposure 31.4 yr, mean retirement 5.6 yr c) 2 with other diseases: mean exposure 26.7 yr, mean retirement 10.3 yr d) All 20 workers: mean exposure 30.4 yr, mean retirement 7.4 yr e) 8 controls. No malignancies, cardiovascular disease in 80% of deaths All autopsies, post-1975. No significant differences between smokers, ex-smokers and non-smokers. Copper smelter workers, northern Sweden, mean age 67.8 yr. Controls, rural residents, 50 km from smelter, mean age 67.9 yr NA
9830 Liver	28	a) Not given b) Not given c) Not given d) Not given e) Not given	a) 4.9 ug/kg b) 3.3 ug/kg c) 9.0 ug/kg d) 5.0 ug/kg e) 5.5 ug/kg Medians, wet wt	a) Smelter workers, 10 with malignancies (33% of deaths): mean exposure 31.2 yr, mean length of retirement 8 yr b) 8 with cardiovascular disease (45% of deaths): mean exposure 31.4 yr, mean retirement 5.6 yr c) 2 with other diseases: mean exposure 26.7 yr, mean retirement 10.3 yr d) All 20 workers: mean exposure 30.4 yr, mean retirement 7.4 yr e) 8 controls. No malignancies, cardiovascular disease in 80% of deaths All autopsies, post-1975. No significant differences between smokers, ex-smokers and non-smokers. Copper smelter workers, northern Sweden, mean age 67.8 yr. Controls, rural residents, 50 km from smelter, mean age 67.9 yr NA

(next page)

Lanthanum
7439-91-0
La
AtW 138.906, MP 920 C, BP 3454 C, VP 3230 mm Hg at 400 C, 3420 mm Hg at 760 C

(continued)

Tissue	Cases Exposure Route	Range	Mean	General Information
9831 Lung	78	a) Not given b) Not given c) Not given d) Not given e) Not given	a) 11.0 ug/kg b) 11.0 ug/kg c) 7.9 ug/kg d) 11.0 ug/kg e) 4.5 ug/kg Medians, wet wt	a) Smelter workers, 23 with malignancies (33% of deaths): mean exposure 31.2 yr, mean length of retirement 8 yr b) 29 with cardiovascular disease (45% of deaths): mean exposure 31.4 yr, mean retirement 5.6 yr c) 12 with other diseases: mean exposure 26.7 yr, mean retirement 10.3 yr d) All 64 workers: mean exposure 30.4 yr, mean retirement 7.4 yr e) 14 controls. No malignancies, cardiovascular disease in 80% of deaths All autopsies, post-1975. No significant differences between smokers, ex-smokers and non-smokers. Copper smelter workers, northern Sweden, mean age 67.8 yr. Controls, rural residents, 50 km from smelter, mean age 67.9 yr NA
KIDNEYS; LIVER; LUNGS; OCCUPATIONAL EXPOSURE; ENVIRONMENTAL EXPOSURE; SWEDEN; AUTOPSIES; CARCINOMAS; CARDIOVASCULAR DISEASES; NEOPLASMS; CHROMIUM; COBALT; LANTHANUM; SMELTERS Gerhardsson, L.; Wester, P.O.; Nordberg, G.F.; Brune, D. 1984 Science of the Total Environment 37:233-246				

Tissue	Cases Exposure Route	Range	Mean	General Information
9832 Lung	a) 1 b) 11 Inhalation	a) Not given b) Not given	a) 45,600 ppb b) 16.6 ppb	a) Exposed worker, biopsy b) Unexposed controls, autopsies 58 yr old photoengraver, exposed to smoke from carbon arc lamp during 46 yr. 20-83 yr old controls. Italy Worker: dyspnea, cough, cyanosis (extremities), crepitant rales, pulmonary fibrosis, hypertension, cardiac hypertrophy and overloading, death from acute cardiorespiratory insufficiency NA
9833 Lymph node	a) 1 b) 3 Inhalation	a) Not given b) Not given	a) 2,310 ppb b) 26 ppb	a) Exposed worker, biopsy b) Unexposed controls, autopsies 58 yr old photoengraver, exposed to smoke from carbon arc lamp during 46 yr. 20-83 yr old controls. Italy Worker: dyspnea, cough, cyanosis (extremities), crepitant rales, pulmonary fibrosis, hypertension, cardiac hypertrophy and overloading, death from acute cardiorespiratory insufficiency NA
NEODYMIUM; YTTERBIUM; TERBIUM; EUROPIUM; LUTETIUM; ITALY; ADULTS; AUTOPSIES; CASE HISTORIES; PNEUMOCONIOSIS; LUNGS; LYMPH NODES; BIOPSIES; CERIUM; LANTHANUM; METALS; SAMARIUM; THORIUM; DUST; FUMES; INHALATION; OCCUPATIONAL HAZARDS; PRINTING INDUSTRY; OCCUPATIONAL EXPOSURE Vecaturo, G.; Colombo, P.; Zanoni, M.; Rodi, F.; Sabbioni, E.; Pietra, R. 1983 Chest 83(5):780-783				

Lead
7439-92-1
Pb
AtW 207.2, MP 327.4 C, BP 1740 C, VP 1.77 mm Hg at 1000 C, 1 mm Hg at 970 C, 10 mm Hg at 1160 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9834 Aorta	a) 3 b) 6 c) 7	a) 11-28 ppm b) 1.3-2.3 ppm c) Not given Dry wt	a) Not given b) Not given c) 3.3+/-2.1 ppm Dry wt	a) Sclerotic aorta from metal-workers b) Normal aorta from metal-workers c) Normal aorta from non metal-workers 45-66 yr old workers. Autopsies, Japan, 1976-1977. Employed 7-32 yr ES
AORTA; VERTEBRAE; BONES; ENVIRONMENTAL EXPOSURE; OCCUPATIONAL EXPOSURE; JAPAN; AUTOPSIES; CADAVERS; CARDIOVASCULAR DISEASES; MINERALS; BIOACCUMULATION; DIETS; FOODS; MINERAL DEPOSITS; CALCIUM; PHOSPHORUS; IRON; MAGNESIUM; ZINC; ALUMINUM; COPPER; CADMIUM; LEAD; NICKEL; VANADIUM; CHROMIUM; MANGANESE; SILICON; TIN; TITANIUM; STRONTIUM Terasoka, H. 1984 Archives of Environmental Contamination and Toxicology 13:119-127				

Tissue	Cases Exposure Route	Range	Mean	General Information
9835 Blood		a) 220-900 ug/L b) 180-1275 ug/L c) 175-700 ug/L d) 50-175 ug/L e) 150-660 ug/L f) 100-360 ug/L	a) 470 ug/L b) 490 ug/L c) 390 ug/L d) 100 ug/L e) 320 ug/L f) 200 ug/L	a) Preschoolers, 2 yr before filter b) School children, 2 yr before filter c) Mothers, 2 yr before filter d) Controls, area with no smelter e) School children, 4 yr after filter f) Mothers, 4 yr after filter Same groups studied after filter installation but with fewer subjects. Ranges and means estimated from graph. Values for control mothers and children combined. 32 families from Mesa valley, Yugoslvia. 21 families from area, no smelter AAS
BLOOD; ENVIRONMENTAL EXPOSURE; YUGOSLAVIA; ADULTS; CHILDREN; LEAD; ZINC ORGANIC COMPOUNDS; AIR POLLUTION; INDUSTRIAL EMISSIONS; BIOACCUMULATION; BIOLOGICAL MONITORING; SMELTERS Prpic-Majic, D.; Mecsner, J.; Telisman, S.; Kersanc, A. 1984 Science of the Total Environment 32:277-288				

Tissue	Cases Exposure Route	Range	Mean	General Information
9836 Blood	2	a) Not applicable b) Not applicable c) Not applicable	a) 13 ug/dL b) 34 ug/dL c) 69 ug/dL	a) Female, peripheral neuropathy from sniffing naphtha b) Male, peripheral neuropathy from sniffing naphtha c) Same male, 3 yr later, sniffing leaded gasoline Protoporphyrin levels also given 16.5 yr old native female, 15.5 native male, Ontario, Canada
ERYTHROCYTES; BLOOD; URINE; DELIBERATE EXPOSURE; CANADA; ADOLESCENTS; NEUROLOGIC MANIFESTATIONS; HYDROCARBONS; FUMES; GASOLINE; INHALATION Tenenbein, M.; deGroot, W.; Rajani, K.R. 1984 Canadian Medical Association Journal 131:1077-1079				

Lead
7439-92-1
Pb
AtW 207.2, MP 327.4 C, BP 1740 C, VP 1.77 mm Hg at 1000 C, 1 mm Hg at 970 C, 10 mm Hg at 1160 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9337 Blood	1	a) Not given b) Not given c) Not given d) Not given	a) 414 ug/L b) 426 ug/L c) 180 ug/L d) 160 ug/L	a) During EDTA therapy b) After EDTA therapy c) 4 yr later, before EDTA d) 5 yr later, during EDTA therapy Patient with toxogenic disease which sensitized him to Pb. Abdominal symptoms, a) and b) while working with paints, no protective mask. 30 yr old painter, F.R.G. Acute abdominal-neurologic syndrome (abdominal pains, paresthesia) Ulcus duodeni, icterus, fatty liver disease, blue seam at gingiva, normochrome anemia, hypertonus. Red, white cell poesis balanced, normoblasts, basophilic stipling. High ALA, coproporphyrin excretion AAS
BLOOD; URINE; OCCUPATIONAL EXPOSURE; GERMANY; ADULTS; LEAD POISONING; LEAD; OCCUPATIONAL HAZARDS; PAINTS; GENETIC EFFECTS Doss, M.; Laubenthal, F.; Stoeppler, M. 1984 International Archives of Occupational and Environmental Health 54:55-63				

Tissue	Cases Exposure Route	Range	Mean	General Information
9338 Blood	a) 680 b) 96 c) 144	a) Not given b) Not given c) Not given	a) 31.1+/-9.69 ug/dl b) 20.2+/-6.62 ug/dl c) 19.2+/-7.07ug/dl	a) Active smelter workers b) Retirees and ex-employees of smelter c) Copper and gold miners, never employed in smelter Data also given for different job catagories of smelter workers AAS
BLOOD; URINE; OCCUPATIONAL EXPOSURE; ADULTS; CADMIUM; LEAD; ARSENIC; INDUSTRIAL PLANTS; SMELTERS; ZINC ORGANIC COMPOUNDS Lilis, R.; Valciukas, J.A.; Weber, J.P.; Fischbein, A.; Nicholson, W.J.; Campbell, C.; Malkin, J.; Selikoff, I.J. 1984 Environmental Research 33:76-95				

Tissue	Cases Exposure Route	Range	Mean	General Information
9339 Blood	2	a) Not applicable b) Not applicable	a) 3.75 umol/L b) 1.24 umol/L	a) Subject who had recently removed old paint from walls. Tested because of Pb poisoning in pet cat b) Subject who lived in the same house as a) Abdominal pains
BLOOD; ENVIRONMENTAL EXPOSURE; CASE HISTORIES; LEAD POISONING; LEAD; PAINTS Watson, A.D.J. 1984 Medical Journal of Australia 1(6):254				

Lead
7439-92-1
Pb
AtW 207.2, MP 327.4 C, BP 1740 C, VP 1.77 mm Hg at 1000 C, 1 mm Hg at 970 C, 10 mm Hg at 1160 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9340 Blood	52	18-94 ug/dl	56.6 ug/dl	Automobile assembly plant workers chronically exposed to low levels of inorganic Pb. Approx 65% had levels below 60 ug/dl, 15.4 %, levels below 40 ug/dl Workers employed from less than 1 to <10 yr, mean ages 36.5+/-13.4 yr. Nonexposed controls, used in eye movement tests, mean age 37.9+/-13 yr Age effects on saccadic eye movement in controls disrupted in exposed. Effects of Pb greater in younger workers. Authors suggest quantitative assessment of eye movements may be important in studying subclinical CNS dysfunction resulting from Pb-exposure. Oculomotor function tests: Exposed showed decrease in saccade accuracy, increase in overshoots. Maximum velocity was lowered, but not significantly. AAS
LEAD; OCCUPATIONAL EXPOSURE; BLOOD; NEUROLOGIC MANIFESTATIONS; PROTOPORPHYRINS; AUTOMOTIVE; INDUSTRIAL PLANTS; LEAD POISONING; METAL POISONING Glickman, L.; Valciukas, J.A.; Lilis, R.; Weisman, I. 1984 International Archives of Occupational and Environmental Health 54:115-125				

Tissue	Cases Exposure Route	Range	Mean	General Information
9341 Blood	1 Ingestion	a) Not applicable b) Not applicable c) Not applicable d) Not applicable	a) 3.7 umol/L b) 4.4 umol/L c) 1.11 umol/L d) 1.50 umol/L	a) Level before Ca-EDTA chelation treatment b) 7 d after starting treatment c) 11 wk after treatment d) 12 mo after treatment Normal, 0.24-0.48 umol/L. Ca-EDTA, 50 mg/kg body wt/d for 5 d, IM. 3 of these regimens ended 6 wk after admission. 2 yr old AAS
BLOOD; URINE; ENVIRONMENTAL EXPOSURE; AUSTRALIA; CHILDREN; LEAD POISONING; METAL POISONING; ACCIDENTAL POISONING; BIOACCUMULATION Kazacos, M.; Moore, P. 1984 Medical Journal of Australia 140:429-430				

Tissue	Cases Exposure Route	Range	Mean	General Information
9342 Blood	89	32-530 ng/ml	119.0+/-93.9 ng/ml	No significant relationships with levels in hair or milk, or with locations Lactating 22-47 yr olds, rural and urban areas, Tucson, AZ AAS
LEAD; BLOOD; MILK; HAIR; LACTATION; RURAL AREAS; URBAN AREAS; ENVIRONMENTAL EXPOSURE Rockway, S.W.; Weber, C.W.; Lei, K.Y.; Kemberling, S.R. 1984 International Archives of Occupational and Environmental Health 53:181-187				

Lead
7439-92-1
Pb
AtW 207.2, MP 327.4 C, BP 1740 C, VP 1.77 mm Hg at 1000 C, 1 mm Hg at 970 C, 10 mm Hg at 1160 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9343 Blood	4354	Not given	6.99+/-3.26 ug/dL	Umbilical cord blood, subset from 11,837 infants. Extensive data on demography, pregnancy, delivery for subset. Environmental factors statistically analyzed for 249 of these indicated significance of maternal age, alcohol and coffee drinking, parity, Pb in dust, cigarette and drug use, education, race, and age. Not covarying were water, air, or paint Pb or traffic density. Temporal and geographic patterns exist. Boston, MA, births from 4/79-4/81 Voltammetry

BLOOD; ENVIRONMENTAL EXPOSURE; MASSACHUSETTS; NEWBORN; LEAD; PREGNANCY; SMOKING; ALCOHOLIC BEVERAGES; DRINKING WATER; SOILS; CAFFEINE; DUST
Rabinowitz, M.B.; Needleman, H.L. 1984 Biological Trace Element Research 6:57-67

Tissue	Cases Exposure Route	Range	Mean	General Information
9344 Blood	1 Inhalation	Not applicable	0.5 umol (10.4 ug/100 ml)	Subject sampled 48 hr after smelting 182 kg Pb for 24 hr in enclosed environment, died 72 hr later. Normal levels are <10 nmol (<0.11 ug/100 ml). Healthy 36 yr old AAS

BLOOD; BRAIN; HEART; INTESTINES; KIDNEYS; LIVER; LUNGS; MUSCLES; SKIN; SPLEEN; STOMACH; URINE; ENVIRONMENTAL EXPOSURE; UNITED KINGDOM; ADULTS; AUTOPSIES; METAL POISONING; CADMIUM; LEAD; INHALATION
Taylor, A.; Jackson, M.A.; Patil, D.; Burston, J.; Lee, H.A. 1984 British Medical Journal 288:1270-1271

Tissue	Cases Exposure Route	Range	Mean	General Information
9345 Blood	1068	a) 20-250 ug/l b) 15-161 ug/l	a) 64.4 ug/l b) 52.9 ug/l	a) 522 males, $p<0.0001$ b) 546 females Significant decrease with age in females ($p<0.0001$). 6.9 ug/l higher ($p=0.004$) near smelter. Levels higher in urban than rural. 7.0 ug/l ($p=0.003$) in Landskrona (excluding smelter), 10.5 ug/l ($p<0.001$) in Trelleborg. No difference between urban or rural areas. Values corrected for sex, age, blood hemoglobin levels, parents' occupations, hobbies, and time trends. Swedish 8-16 yr olds, from Landskrona and Trelleborg. Smelter in Landskrona. AAS

BLOOD; ENVIRONMENTAL EXPOSURE; SWEDEN; CHILDREN; LEAD; AIR POLLUTION; INDUSTRIAL EMISSIONS; SMELTERS; RURAL AREAS; URBAN AREAS; AUTOMOTIVE; SEX; AGE; INDUSTRIAL POLLUTION; BIOACCUMULATION; BIOLOGICAL MONITORING
Schutz, A.; Ranstam, J.; Skerfving, S.; Tejning, S. 1984 Ambio 13:115-117

Lead
7439-92-1
Pb
AtW 207.2, MP 327.4 C, BP 1740 C, VP 1.77 mm Hg at 1000 C, 1 mm Hg at 970 C, 10 mm Hg at 1160 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9846 Blood	231	a) 17-253 ppb b) 9-519 ppb	a) 78+/-54 ppb b) 84+/-77 ppb	a) Maternal, 105 cases b) Cord, 95 cases Significant positive correlation. Determinations over 5-yr period. Nagoya, Japan, 1974-1978. Maternal venous and umbilical cord blood. Normal deliveries. AAS

ZINC; MERCURY; METHYLMERCURY; LEAD; CADMIUM; MANGANESE; COPPER; IRON; JAPAN; BLOOD; PLACENTA; UMBILICAL CORD; METALS; ENVIRONMENTAL EXPOSURE
Tsuchiya, H.; Mitani, K.; Kodama, K.; Nakata, T. 1984 Archives of Environmental Health 39(1):11-17

Tissue	Cases Exposure Route	Range	Mean	General Information
9847 Blood	a) 56 b) 51 c) 42 d) 30 e) 38	a) Not given b) Not given c) Not given d) Not given e) Not given	a) 13.2+/-4.76 ug/dl b) 9.7+/-2.69 ug/dl c) 8.9+/-2.48 ug/dl d) 8.9+/-2.90 ug/dl e) 7.9+/-1.86 ug/dl	a) Cardiff, major city b) Port Talbot, medium-sized city c) Dwellings beside major roads in 3 valleys d) Dwellings in cule-de-sac e) Henllan, village Levels show heterogeneity ($P < 0.001$), and increase with traffic volume. No high levels detected in water, nevertheless, authors concluded that water was an important contributor to blood lead. Random samples from 5 areas of Wales AAS

BLOOD; ENVIRONMENTAL EXPOSURE; WALES; LEAD; AIR POLLUTION; DRINKING WATER; WATER POLLUTION; UNITED KINGDOM
Elwood, P.C.; Gallacher, J.E.J.; Phillips, K.M.; Davies, B.E.; Toothill, C. 1984 Nature 310:138-140

Tissue	Cases Exposure Route	Range	Mean	General Information
9848 Blood	a) 35 b) 36 c) 52 d) 48 e) 36 f) 30	a) Not given b) Not given c) Not given d) Not given e) Not given f) Not given	a) 15.4+/-7.7 ug/dl b) 10.2+/-2.8 ug/dl c) 13.1+/-3.4 ug/dl d) 11.1+/-4.4 ug/dl e) 9.5+/-2.4 ug/dl f) 6.4+/-2.5 ug/dl	a) Males, island of Sark, no petrol-driven vehicles b) Females, Sark c) Males, Channel Island of Jersey, very heavy traffic d) Females, Jersey e) Males, Welsh industrial valley of Ebbw Vale f) Females, Ebbw Vale Healthy residents of Sark, Jersey, and Welsh Valley of Ebbw Vale AAS

BLOOD; ENVIRONMENTAL EXPOSURE; UNITED KINGDOM; LEAD; AUTOMOTIVE; AIR POLLUTION; FUEL ADDITIVES; GASOLINE; INDUSTRIAL AREAS
Elwood, P.C.; Essex-Cater, A.; Robb, R.C. 1984 Lancet 2(8398):355

Lead
7439-92-1
Pb
AtW 207.2, MP 327.4 C, BP 1740 C, VP 1.77 mm Hg at 1000 C, 1 mm Hg at 970 C, 10 mm Hg at 1160 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9849 Blood	1 Inhalation	42-300 ug/l	Not given	4 days before to 200 days after exposure to Pb-contaminated cigarettes. Peak at 7 days, then rapid fall. 3 others, fitters, had levels of 42, 62, and 80 ug/dl. Erythrocyte zn-protoporphyrin also estimated. 31 yr old welder working in battery factory
BLOOD; URINE; OCCUPATIONAL EXPOSURE; UNITED KINGDOM; ADULTS; INDUSTRIAL HYGIENE; LEAD Williams, M.K. 1984 Journal of Occupational Medicine 26(7):532-538				

Tissue	Cases Exposure Route	Range	Mean	General Information
9860 Blood	a) 5 b) 1	a) 55.7-60.6 ug/100ml b) Not applicable	a) Not given b) 11.4 ug/100ml	a) Non-ferrous smelter workers b) Control, author of paper Belgium Pyrimidine 5'-Nucleotidase activity decreased
OCCUPATIONAL EXPOSURE; BLOOD; BELGIUM; ADULTS; IN VITRO ANALYSIS; LEAD; CADMIUM; MERCURY; METALS; ENZYMES; SMELTERS Mohammed-Brahim, B.; Buchet, J.P.; Bernard, A.; Lauwerys, R. 1984 Toxicology Letters 20:195-199				

Tissue	Cases Exposure Route	Range	Mean	General Information
9851 Blood	579	2.9-30.3 ug/100 ml	9.00+/-3.30 ug/100 ml Geometric=8.49 ug/100 ml Median=8.30 ug/100 ml	Randomly selected subjects. Statistical analysis (variables smoking, occupation, place of residence and sex) also given. Slight increase with smokers. Greater increase, female smokers. Women, lower levels 285 60-65 yr olds (146 men, 139 women), Cologne. 294 60-65 yr olds (140 men, 154 women), Meckenheim and Rheinbach, FRG AAS
BLOOD; CONSUMER EXPOSURE; ENVIRONMENTAL EXPOSURE; GERMANY; ADULTS; CADMIUM; LEAD; METALS; SMOKING; RURAL AREAS; URBAN AREAS; SEX Brockhaus, A.; Freier, I.; Ewers, U.; Jermann, E.; Dolgner, R. 1985 International Archives of Occupational and Environmental Health 57:167-175				

Tissue	Cases Exposure Route	Range	Mean	General Information
9852 Blood	58	a) 5-59 ug/dL b) 21-46 ug/dL c) 5-59 ug/dL	a) Not given b) Not given c) Not given	a) All subjects b) 17 black males c) 41 white males Estimated from graph. Samples tested for relationship between thyroid function and Pb level. None was found. Random sample of employees, each exposed to more than 30 ug/cum. Duration of exposure 3-10 yr. ASV
BLOOD; THYROID GLANDS; OCCUPATIONAL EXPOSURE; LEAD; BIOLOGICAL MONITORING Refowitz, R.M. 1984 Journal of Occupational Medicine 26(8):579-583				

Lead
7439-92-1
Pb
AtW 207.2, MP 327.4 C, BP 1740 C, VP 1.77 mm Hg at 1000 C, 1 mm Hg at 970 C, 10 mm Hg at 1160 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9888 Blood		a) Not given b) 90-150 ng/ml c) 50-80 ng/ml d) Not given e) Not given	a) 200 ng/ml b) Not given c) Not given d) 30 ng/ml e) 8 ng/ml	a) India (Bangalore), Italy, Mexico, some parts of US, Canada b) West European countries, most of US, Israel, Peru c) Parts of Sweden, Japan, China d) Nepal e) Venezuela, some remote areas Levels from database containing data on "normal" levels of 15 elements in 7 tissues/fluids. Data selected by 60 investigators in over 40 countries. Diet, environment both important in distribution of elements.
ZINC; COPPER; MANGANESE; SELENIUM; LEAD; CADMIUM; BLOOD; BLOOD SERUM; HAIR; MILK; BANGLADESH; INDIA; TURKEY; FINLAND; ITALY; NEW ZEALAND; GUATEMALA; CHILE; SWEDEN; HUNGARY; YUGOSLAVIA; POLAND; KENYA; EGYPT; SOUTH AFRICA; UNITED STATES; AUSTRALIA; GREECE; PAKISTAN; NIGERIA; PHILIPPINES; ZAIRE; THAILAND; CHINA; WYOMING; OHIO; CALIFORNIA; JAPAN; MEXICO; CANADA; ISRAEL; PERU; SPAIN; COMPARATIVE EVALUATIONS; BIOLOGICAL MONITORING; IRAN; DIETS; ENVIRONMENTAL EXPOSURE				
Iyengar, G.V. 1984 Science of the Total Environment 38:125-131				

Tissue	Cases Exposure Route	Range	Mean	General Information
9884 Blood	a) 153 b) 36	a) 22-90 ug/dl b) Not given	a) 53.2 ug/dl b) <20 ug/dl	a) Workers b) Controls Matched for age and alcolo: consumption (all <80 g/d). TWA=54.0 ug/dl (range, 220-87.0 ug/dl) for workers. Storage battery manufacturing plant workers, 19-60 yr old (median 40) and controls, 19-60 yr old (median 40), FRG Continous percentual increase of abnormal NCV with increasing levels. <70 ug/dl, no functionally significant slowing of NCV. Stepwise Multiple Regression, significant relationship, NCV, age, blood Pb AAS
BLOOD; OCCUPATIONAL EXPOSURE; GERMANY; ADULTS; NEUROLOGIC MANIFESTATIONS; LEAD; OCCUPATIONAL HAZARDS				
Triebig, G.; Weltle, D.; Valentin, H. 1984 International Archives of Occupational and Environmental Health 53:189-204				

Tissue	Cases Exposure Route	Range	Mean	General Information
9886 Blood	90	9.0-60.0 ug/dL pcv	33.4+/-14.8 ug/dL pcv	Data given for measurement of erythrocyte and zinc protoporphyrins as screening test for toxicity Chronically exposed workers AAS
BLOOD; METAL POISONING; LEAD POISONING; MEASUREMENT METHODS; COMPARATIVE EVALUATIONS; LEAD				
Harada, K.; Miura, H. 1984 International Archives of Occupational and Environmental Health 53: 365-377				

Lead
7439-92-1
Pb
AtW 207.2, MP 327.4 C, BP 1740 C, VP 1.77 mm Hg at 1000 C, 1 mm Hg at 970 C, 10 mm Hg at 1160 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9856 Blood	1241 Inhalation	0.24-2.68 umol/L	0.88 umol/L	Screening by finger-prick sampling. Geometric mean, 0.82 umol/L. 1.45 umol/L considered "level of concern". Screening technique comparable to using venous samples. Study done by The Broken Hill Association Smelters Pty. Ltd. at request of School Parent Body Children of Port Pirie, South Australia AAS
BLOOD; ENVIRONMENTAL EXPOSURE; AUSTRALIA; CHILDREN; LEAD; SMELTERS; MEASUREMENT METHODS Sinclair, D.P.; Dahnt, B.R.. 1984 Clinical Chemistry 30(10): 1616-1619				

Tissue	Cases Exposure Route	Range	Mean	General Information
9857 Blood	a) 96 b) 22	a) 13-91 ug b) 6-16 ug /100 ml	a) 51+/-16 ug b) 11+/-3 ug /100 ml	a) Smelter employees b) Controls Controls matched for age and sex. Subjective symptoms not good indicators of poisoning since only minor differences found 26-67 yr old (mean 51) smelter employees, mean exposure 22 yr (range 9-45) and non-exposed controls, Denmark AAS
BLOOD; ERYTHROCYTES; OCCUPATIONAL EXPOSURE; DENMARK; ADULTS; LEAD; HEALTH HAZARDS; SMELTERS; COMPARATIVE EVALUATIONS; PROTOPORPHYRINS; ZINC ORGANIC COMPOUNDS Kirkby, H; Nielsen, O.J.; Nielsen, V.K.; Gyntelberg, F. 1983 British Journal of Industrial Medicine 40:314-317				

Tissue	Cases Exposure Route	Range	Mean	General Information
9858 Blood	72 Ingestion	a) 30-56 ug/dL b) 30-66 ug/dL c) <8-20 ug/dL d) <8-16 ug/dL e) 14-15 ug/dL	a) 39 ug/dL b) 42 ug/dL c) 10 ug/dL d) 9 ug/dL e) 34 ug/dL	a) Hospital A, Pb-burdened cases b) Hospital B c) Hospital A, controls d) Hospital B e) 6-12 mo later, 22 cases and 3 controls 36 cases, 36 controls matched for age, sex, pica. 23 of these matched for ward. Levels of sources given. No correlation between pica habits & blood levels. Most frequent pica was paper, in controls, fabric. Paint, soil, other ingested significantly more often ($p<0.004$) by Pb-burdened. Developmentally disabled, 10-40 yr olds with pica, IQ of 3-4 yr old, state hospital residents, California AAS
BLOOD; CONSUMER EXPOSURE; ENVIRONMENTAL EXPOSURE; CALIFORNIA; CHILDREN; ADULTS; PICA; LEAD POISONING; LEAD; METALS; MENTAL RETARDATION Yaffe, Y.; Jenkins, D.; Mahon-Haft, H.; Winkelstein, W.; Plessel, C.P.; Wesolowski, J.J. 1984 Science of the Total Environment 32:261-275				

Lead
7439-92-1
Pb
AtW 207.2, MP 327.4 C, BP 1740 C, VP 1.77 mm Hg at 1000 C, 1 mm Hg at 970 C, 10 mm Hg at 1160 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9859 Blood	538	Not given	274 ug/l	Higher than medians from 8 area in Belgium (of which highest, 240 ug/l, had soft water, Pb in pipes). Max EEC reference value 200 ug/l. Possible sources occupational, environmental, or food contamination. 16-86 yr olds, Malta AAS

BLOOD; ENVIRONMENTAL EXPOSURE; CONSUMER EXPOSURE; OCCUPATIONAL EXPOSURE; MALTA; BELGIUM; CADMIUM; LEAD

Bruaux, P.; Claeys-Thoreau, F.; Ducoffre, G.; Lafontaine, A.; Grech, A.; Vassallo, A. 1988 International Archives of Occupational and Environmental Health 59:119-126

Tissue	Cases Exposure Route	Range	Mean	General Information
9860 Blood	a) 17 b) 11 c) 5 d) 11 e) 8 f) 10	a) 13.2-92.2 ug b) 6.5-21.5 ug c) 15.4-55.4 ug d) 12.9-20.7 ug e) 7.5-15.9 ug f) 17.4-44.6 ug /100 g	a) 35.1 ug b) 13.7 ug c) 31.8 ug d) 16.4 ug e) 11.7 ug f) 27.6 ug /100 g	a) Adults doing cutlery-tempering at home, 8 households b) Other family members, >14 yr old c) Other family members, <12 yr old d) Adults doing type-printing at home, 7 households e) Other family members, >14 yr old f) Other family members, <12 yr old Ingestation of dust probable exposure route for children. Families in which Pb-work is done at home, Japan Flameless atomization

BLOOD; URINE; ENVIRONMENTAL EXPOSURE; OCCUPATIONAL EXPOSURE; JAPAN; ADULTS; CHILDREN; LEAD; DUST; HEALTH HAZARDS; INHALATION; OCCUPATIONAL HAZARDS

Kawai, M.; Toriumi, H.; Katagiri, Y.; Maruyama, Y. 1988 International Archives of Occupational and Environmental Health 59:37-46

Tissue	Cases Exposure Route	Range	Mean	General Information
9861 Blood	a) 10 b) 8 c) 1 d) 1 e) 1 Ingestion.	a) 28-43 ug/dL b) 5-22 ug/dL c) 33-43 ug/dL d) 25-37 ug/dL e) Not given	a) 35 ug/dL b) 13 ug/dL c) 38 ug/dL d) 32 ug/dL e) 17 ug/dL	a) Children (in extended family) exposed by environmental contact b) Controls, nonburdened children, same city c) Twin A, probably exposed by soil pica d) Twin B, probably exposed by soil pica e) Mother of twins. History of high Pb before pregnancy Also, environmental measurements, details of lifestyles included. 3-15 yr olds in extended family in dilapidated home near elevated freeway. Mother and 2 yr old twins. Oakland, CA AAS

BLOOD; ENVIRONMENTAL EXPOSURE; CALIFORNIA; CHILDREN; LEAD POISONING; MEASUREMENT METHODS; LEAD; BIOACCUMULATION; GASOLINE; HEALTH HAZARDS; PAINTS; PICA; AIR POLLUTION; CASE HISTORIES; INHALATION; LAND POLLUTION; DUST; SOILS; URBAN AREAS

Yaffe, Y.; Flessel, C.P.; Wesolowski, J.J.; Rosario, A.D.; Guirguis, G.N.; Matias, V.; Degarmo, T.E.; Coleman, G.C.; Gramlich, J.W.; Kelly, W.R. 1983 Archives of Environmental Health 38(4):237-246

Lead
7439-92-1
Pb
AtW 207.2, MP 327.4 C, BP 1740 C, VP 1.77 mm Hg at 1000 C, 1 mm Hg at 970 C, 10 mm Hg at 1160 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9362 Blood	187	0.3-1.4 umol/l	0.75-/+0.20 umol/l	No significant correlations between behavior or intelligence and blood Pb. Levels increased significantly with increasing age of dwelling. 107 boys, 85 girls, all 2.5 yr old AAS
BLOOD; ENVIRONMENTAL EXPOSURE; UNITED KINGDOM; CHILDREN; LEAD; BIOACCUMULATION				
Harvey, P.G.; Hamlin, M.W.; Kumar, R.; Delves, H.T. 1984 Science of the Total Environment 40:45-60				

Tissue	Cases Exposure Route	Range	Mean	General Information
9363 Blood	a) 1 b) 1 c) 1 d) 1 Ingestion	a) Not given b) Not given c) Not given d) Not given	a) 81 ug/% b) 56.2 ug/% c) 49.1 ug/% d) 21 ug/%	a) Husband. After EDTA therapy for 30 d, 72.6 ug/% and 50 d, 51.8 ug/% b) Wife c) Sister of b), value in normal range d) Son of c), value in normal range All but son drank homemade wine with high Pb levels from walls of vat Family members 44, 40, 24 and 11 year old. Older members had symptoms of severe Pb intoxication Symptoms of intoxication included abdominal pain and GI effects, anemia, increased ZPP and Ala-U AAS
DELIBERATE EXPOSURE; LEAD; ALCOHOLIC BEVERAGES; CASE HISTORIES; URINE; BLOOD				
Perrelli, G.; Capellaro, E.; Pitas, E.; Maina, G.; Vergnano, P. 1984 American Journal of Industrial Medicine 5:377-381				

Tissue	Cases Exposure Route	Range	Mean	General Information
9364 Blood	463	0.77-7.30 umol/l	2.84+/-1.23 umol/l	85% of subjects exceeded the EEC reference level of 35 ug/100 ml or 1.68 umol/l. Leadworkers' children (104) had mean levels of 3.36+/-1.38 umol/l, significantly higher ($P<0.0001$) than the 2.73+/-1.15 umol/l of non-leadworkers' children. Leadworkers took used "filters", containing high quantities of particulate Pb, from the smelter for use in their homes. Brasil, State of Bahia, children 1-9 yr living in 900 m radius of Santa Amaro City lead smelter AAS
LEAD; INDUSTRIAL AREAS; CHILDREN; BLOOD; ENVIRONMENTAL EXPOSURE; BRAZIL; LEAD POISONING; INDUSTRIAL EMISSIONS; AIR POLLUTION				
Carvalho, F.M.; Barreto, M.L.; Silvany-Neto, A.M.; Waldron, H.A.; Tavares, T.M. 1984 Science of the Total Environment 35:71-84				

Lead
7439-92-1
Pb
AtW 207.2, MP 327.4 C, BP 1740 C, VP 1.77 mm Hg at 1000 C, 1 mm Hg at 970 C, 10 mm Hg at 1160 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9365 Blood	a) 22 b) 11 c) 11 Ingestion	a) 29.5-39.5 ug/dl b) 26.5-26.4 ug/dl c) 26.27-24.26 ug/dl	a) Not applicable b) Not applicable c) Not applicable	a) Chelating agent, penicillamine b) Hyperactivity suppressor, methylphenidate c) Placebo Ranges of means, baseline and 12 wk measurements from double blind study. 250 mg penicillamine or placebo 2-3X/d depending on wt. 5-10 mg/d increasing to 40 mg/d methylphenidate or placebo. Both treatments improved behavior problems initially caused by elevated Pb. Hyperkinetic 4.5-10.5 yr olds. Blacks, Hispanics, and Caucasians of similar socioeconomic status. Moderately elevated Pb levels. AAS
BLOOD; ENVIRONMENTAL EXPOSURE; NEW YORK; CHILDREN; BEHAVIOR DISORDERS; CENTRAL NERVOUS SYSTEM DISEASES; LEAD POISONING; CHELATING AGENTS; LEAD; BIOACCUMULATION David, O.J.; Hoffman, S.P.; Clark, J.; Grad, G.; Sverd, J. 1985 Archives of Environmental Health 38(6):341-346				

Tissue	Cases Exposure Route	Range	Mean	General Information
9366 Blood	a) 74 b) 74 c) 67	a) 1.8+/-0.7-6.5+/-3.6 ug/dl b) 6.6+/-0.6-8.6+/-7.6 ug/dl c) 7.1+/-6.4-14.0+/-3.4 ug/dl	a) Not given b) Not given c) Not given	a) Newborn (cord-blood) - 24 mo, in lowest decile selected, for longitudinal study, from 11,837 births b) Newborn - 24 mo, in middle decile c) Newborn - 24 mo, in highest decile Ranges of means. Mean levels of total study population did not decline over time. Changes for each subject during each time interval also reported. 62% moved to a different tertile (third) during the study. Modest trend toward increasing stability of PbB with age. Healthy newborns, Boston area ASV
BLOOD; ENVIRONMENTAL EXPOSURE; MASSACHUSETTS; AGE; INFANTS; NEWBORN; LEAD; URBAN AREAS Rabinowitz, M.; Leviton, A.; Needleman, H. 1984 Archives of Environmental Health 39(2):74-77				

Lead
7439-92-1
Pb
AtW 207.2, MP 327.4 C, BP 1740 C, VP 1.77 mm Hg at 1000 C, 1 mm Hg at 970 C, 10 mm Hg at 1160 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9867 Blood		a) 150-190 ug/l b) 150-190 ug/l c) Not applicable d) Not applicable e) 140-180 ug/l Medians	a) Not given b) Not given c) 240 ug/l d) 180 ug/l e) Not given Medians	a) 5 urban, 1 suburban areas b) 4 risk areas c) Verviers, another risk area with soft water, Pb-pipes d) Rural area, control e) 7-12 yr olds, 2 risk areas 1979. Adults in a)-d). All except c) agree with EEC reference of 200 ug/l. Additional samples from adults in 1981 in areas comparable to a) were slightly lower, 130-152 ug/l, possibly related to reduced Pb in gasoline. Children, Verviers, 1981, 195 ug/l. Another children's sample from smelter area was 260 ug/l Samples from Belgian population, some in risk areas, none occupationally exposed AAS
BLOOD; CONSUMER EXPOSURE; ENVIRONMENTAL EXPOSURE; BELGIUM; ADULTS; CHILDREN; COMPARATIVE EVALUATIONS; LEAD; DRINKING WATER; INDUSTRIAL POLLUTION; SMELTERS; AGE Claeys-Thoreau, F.; Bruaux, P.; Ducoffre, G.; Lafontaine, A. 1983 International Archives of Occupational and Environmental Health 53:109-117				

Tissue	Cases Exposure Route	Range	Mean	General Information
9868 Blood				Review of 48 articles on industrial lead poisoning during the past 33 yr explored relationship of air lead levels with prevalence of plumbism. Studies involved 2504 subjects. More recent study of effect of environmental lead pollution on blood lead levels in school children is included.
CHINA; LEAD; BLOOD; URINE; REVIEW; ENVIRONMENTAL EXPOSURE; LEAD POISONING; CHILDREN; ADULTS; INDUSTRIAL DISEASES; MEASUREMENT METHODS; OCCUPATIONAL EXPOSURE; OCCUPATIONAL DISEASES Wang, Y.L. 1984 Ecotoxicology and Environmental Safety 8:526-530				

Tissue	Cases Exposure Route	Range	Mean	General Information
9869 Blood	a) 45 b) 23 c) 22 d) 26 e) 21	a) 9.2-36.7 ug/dl b) 12.8-36.7 ug/dl c) 9.2-24.1 ug/dl d) 1.8-17.4 ug/dl e) 4.5-25.0 ug/dl	a) 17.7 ug/dl b) 18.4 ug/dl c) 16.9 ug/dl d) 9.4 ug/dl e) 12.1 ug/dl Geometric	a) Total for Bombay residents b) Adult females c) Adult males d) Children e) Pure City residents 200 km SE of Bombay Additional data from study in progress of a clean suburban area, Deonar had, for children, geometric mean of 9.4 ug/dl, range 1.8-17.4 ug/dl in blood. Levels in air, foods and estimates of intake, uptake given. Normal healthy adults and children (5-12 yr old) from Bombay and Pure City India DPASV
ENVIRONMENTAL EXPOSURE; BLOOD; LEAD; URBAN AREAS; ADULTS; CHILDREN; POPULATION EXPOSURE; DIETS; FOOD CONTAMINATION; AIR POLLUTION; WATER POLLUTION; SMOKING; RURAL AREAS; INDIA; METALS Khandekar, R.N.; Mishra, U.C.; Vohra, K.G. 1984 Science of the Total Environment 40:269-278				

Lead
7439-92-1
Pb
AtW 207.2, MP 327.4 C, BP 1740 C, VP 1.77 mm Hg at 1000 C, 1 mm Hg at 970 C, 10 mm Hg at 1160 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9370 Blood	a) 114 b) 131 c) 46 d) 54	a) 5.3-54.9 ug/dl b) 4.0-54.9 ug/dl c) 2.8-17.8 ug/dl d) 3.3-20.7 ug/dl	a) 12.4+/-4.4 ug/dl b) 15.1+/-5.5 ug/dl c) 7.6+/-3.0 ug/dl d) 8.3+/-3.1 ug/dl	a) Unexposed male factory workers b) Exposed male workers c) Unexposed female factory workers d) Exposed female workers. Levels considered within normal range. Exposure was to Hg vapor. Male and female factory workers, ages 30.9 and 29.9 yr, exposure durations 4.8 and 7 yr. Matched controls. Belgium AAS

MERCURY; BLOOD; URINE; OCCUPATIONAL EXPOSURE; SEX; BELGIUM; HEALTH HAZARDS; OCCUPATIONAL HAZARDS; INHALATION; LEAD; CADMIUM; ZINC; INDUSTRIAL ATMOSPHERES; BIOINDICATORS; NEUROLOGIC MANIFESTATIONS

Roels, H.; Gennart, J.-P.; Lauwerys, R.; Buchet, J.-P.; Malchaire, J.; Bernard, A. 1984 American Journal of Industrial Medicine 7:45-71

Tissue	Cases Exposure Route	Range	Mean	General Information
9371 Blood	a) 5 b) 2	a) 867-991 ug/l b) 827-634 ug/l	a) Not given b) Not given	a) Day 1 after removal of workers from plant b) Day 22 and 26 Temporary return by 2 workers led to increased level in one case, continued decline in the other. Workers in storage battery lead recovery plant AAS

BLOOD; SALIVA; OCCUPATIONAL EXPOSURE; LEAD; INDUSTRIAL ATMOSPHERES; INDUSTRIES; MINERAL METABOLISM; OCCUPATIONAL HAZARDS

Brodeur, J.; Lacasse, Y.; Talbot, D. 1983 Toxicology Letters 19:195-199

Tissue	Cases Exposure Route	Range	Mean	General Information
9372 Blood	a) 20 b) 20 c) 20	a) 45.9-60 ug/100 ml b) 25.9-35 ug/100 ml c) 11.11-27.1 ug/100 ml	a) 52.2+/-5.1 ug/100 ml b) 31.7+/-2.9 ug/100 ml c) 20.4+/-6 ug/100 ml	a) Electric storage battery plant workers, significantly poorer performance on psychological tests b) Workers within "normal" range, test performance similar to controls c) Controls, not employed at plant Threshold for impaired performance below current TLV of 60 ug/100 ml. Mean occupational exposure 11.5 yr. 30-45 yr old males matched for age and other parameters. Italy. Reduced performance in perceptual and psychomotor tasks, verbal comprehension and abstraction. Physical complaints (neurovegetative gastrointestinal, neurological symptoms). AAS

OCCUPATIONAL DISEASES; LEAD; BLOOD; METAL POISONING; NEUROLOGIC MANIFESTATIONS; OCCUPATIONAL EXPOSURE; METALS; HEALTH HAZARDS; OCCUPATIONAL HAZARDS; ITALY; LEAD POISONING

Campara, P.; D'Andrea, F.; Micciolo, R.; Savonitto, C.; Tanzella, M.; Zimmermann-Tanzella, C. 1984 International Archives of Occupational and Environmental Health 53:233-246

Lead
7439-92-1
Pb
AtW 207.2, MP 327.4 C, BP 1740 C, VP 1.77 mm Hg at 1000 C, 1 mm Hg at 970 C, 10 mm Hg at 1160 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9373 Blood	a) 100 b) 65 c) 71 d) 69 e) 39 f) 41 g) 59 h) 75	a) Not given b) Not given c) Not given d) Not given e) Not given f) Not given g) Not given h) Not given	a) 41.3+/-1.1 ug/dl b) 33.2+/-1.5 ug/dl c) 15.5+/-0.6 ug/dl d) 12.3+/-0.4 ug/dl e) 12.1+/-0.5 ug/dl f) 11.3+/-0.4 ug/dl g) 11.5+/-0.3 ug/dl h) 11.5+/-0.3 ug/dl S.E.	a) Directly exposed men, Trail, British Columbia b) Indirectly exposed men, Trail c) Nonexposed men, office workers, Trail d) Controls, men, Nelson, British Columbia e) Wives of directly exposed men f) Wives of indirectly exposed men g) Wives of nonexposed office workers h) Controls, women, Nelson Significantly higher levels in smokers, exposed Trail men. Smelter workers and their wives, Trial, B.C. Controls, living upwind and 30 mi north of smelter emissions, Nelsm, B.C. Significant correlations with 5 health symptoms: poor appetite, insomnia, weakness in arms/legs, heartburn, indigestion, "shakes" and with anergic "days off work ill."
CANADA; ADULTS; GASTROINTESTINAL DISEASES; NEUROLOGIC MANIFESTATIONS; LEAD; OCCUPATIONAL EXPOSURE; ENVIRONMENTAL EXPOSURE Neri, L.C.; Hewitt, D.; Johansen, H. 1983 Archives of Environmental Health 38(3):180-189				

Tissue	Cases Exposure Route	Range	Mean	General Information
9374 Blood	a) 59 b) 68 c) 90	a) 8.20 ug/dl b) 6-25 ug/dl c) 11.6-38 ug/dl	a) 12.6+/-4.7 ug/dl b) 11.4+/-3.3 ug/dl c) 21.6+/-4.3 ug/dl	a) Rural, Rinconada b) Suburban, Cienega de Flores c) Urban Monterrey Difference between a) and b) not significant. Differences between a) and c), b) and c), b) and c) $p<0.001$. Values for RBC protoporphyrin, delta-aminolevulinic acid and hematocrit given. Increased blood levels may be from heavy traffic and industry. Children, Nuevo Leon, Mexico, age 8.7-13.7 yr AAS
MEXICO; CHILDREN; BLOOD; COMPARATIVE EVALUATIONS; LEAD; METALS; TRACE ELEMENTS; BIOINDICATORS; HEALTH HAZARDS; INDUSTRIAL AREAS; POPULATION EXPOSURE; ENVIRONMENTAL EXPOSURE; RURAL AREAS; URBAN AREAS Zuniga Charles, M.A.; Bellerteros, S.M.; Recio, Y.M.; Trujillo, G.C. 1983 Proc. Nest. Pharmacol. Soc. 26:77-79				

Tissue	Cases Exposure Route	Range	Mean	General Information
9375 Blood				Review. 19 studies (from 10 countries) from which relationships between airborne Pb and blood Pb in children of varying ages can be estimated.
REVIEW; BLOOD; ENVIRONMENTAL EXPOSURE; NETHERLANDS; LEAD; AIR POLLUTION; AUTOMOTIVE; INDUSTRIAL POLLUTION; CHILDREN; URBAN AREAS; SOILS; DUST; PAINTS; DRINKING WATER; RURAL AREAS; SMELTERS; TEXAS; YUGOSLAVIA; BELGIUM; CANADA; CZECHOSLOVAKIA; IDAHO; NEBRASKA; SWITZERLAND; NEW YORK; CALIFORNIA; GERMANY; JAPAN; ITALY; IRELAND; UNITED STATES Brunhreef, B. 1984 Science of the Total Environment 38:79-123				

Lead
7439-92-1
Pb
AtW 207.2, MP 327.4 C, BP 1740 C, VP 1.77 mm Hg at 1000 C, 1 mm Hg at 970 C, 10 mm Hg at 1160 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9376 Blood	1	a) Not applicable b) Not applicable c) Not applicable	a) 97 ug/dl b) 32 ug/dl c) 21 ug/dl	a) Level at routine screening. Patient, given 150 mg Ca-disodium edetate and 40 mg dimercaprol, IM every 6 hr for 7 days b) 2 wk after therapy c) 3 wk after therapy 26 mo old black girl, NY At 3 wk, severe acute renal failure caused by either chelation therapy and/or Pb poisoning. Renal failure reversed over 12 days. Symptoms included anorexia, vomiting, lethargy, and pallor.

NEW YORK; CASE HISTORIES; CHILDREN; KIDNEY DISEASES; BLOOD; LEAD; METALS; LEAD POISONING
Khan, A.J.; Patel, U.; Rafeeq, M.; Myerson, A.; Kumar, K.; Evans, H.E. 1983 Journal of Pediatrics 102(1):147-149

Tissue	Cases Exposure Route	Range	Mean	General Information
9377 Blood	a) 75 b) 32 Inhalation Dermal	a) 0.77-5.0 umol/L b) 0.39-1.8 umol/L	a) 2.6+/-0.75 umol/L b) 1.2+/-0.34 umol/L	a) Steady-state, active workers b) Steady-state, retired workers. Undetermined dose. Active workers, 19-65 yr old, 10 yr mean exposure. Retired 53-80 yr olds, 24 yr mean exposure. Exposed: smelter workers, brass founders, scrappers, storage-battery workers, painters. AAS

BONE; BLOOD; OCCUPATIONAL EXPOSURE; ADULTS; SWEDEN; INDUSTRIAL HYGIENE; INDUSTRIAL MEDICINE; LEAD; BIOACCUMULATION; INDUSTRIAL PLANTS; METAL POISONING
Christoffersson, J.O.; Schutz, A.; Ahlgren, L.; Haeger-Aronsen, B.; Mattsson, S.; Skerfving, S. 1984 American Journal of Industrial Medicine 6:447-457

Tissue	Cases Exposure Route	Range	Mean	General Information
9378 Blood	170 Inhalation	a) 42-132 ug/dl b) 33-344 ug/dl c) 60-174 ug/dl d) Not given	a) 74 ug/dl b) 90 ug/dl c) 93 ug/dl d) 18 +or- 5.9 ug/dl	a) Asymptomatic, 14 patients b) Focal central nervous system symptoms, 14 patients c) Encephalopathy, 19 patients d) Junior high school students, 11% had sniffed gasoline, 7.5% regularly, 147 cases Chelation therapy with Ca-disodium edetate and dimercaprol produced mean decrease of 36 +or- 23 ug/dl. 10-20 yr old Navajo Indians with Pb intoxication, caused by gasoline sniffing, July 1974-June 1980, and Indian junior high school students, May 1981, AZ Various symptoms: tremor, ataxia, chorea, nausea, vomiting, irritability, excitement, disorientation, hallucinations, seizures, somnolence or coma. One death. Others asymptomatic within 1-2 mo. AAS

ARIZONA; ADOLESCENTS; RACIAL STUDIES; LEAD POISONING; METAL POISONING; BLOOD; URINE; LEAD; METALS; GASOLINE; DELIBERATE EXPOSURE
Coulehan, J.L.; Hirsch, W.; Brillman, J.; Sanandria, J.; Welty, T.K.; Colaiaco, P.; Koros, A.; Lober, A. 1983 Pediatrics 71(1):113-117

Lead
7439-92-1
Pb
AtW 207.2, MP 327.4 C, BP 1740 C, VP 1.77 mm Hg at 1000 C, 1 mm Hg at 970 C, 10 mm Hg at 1160 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9379 Blood	1 Ingestion	Not applicable	238 ug/dl	Autopsy. Pb curtain weight found in stomach. Ingested >2 mo before death. 2 yr old girl Vomiting, lethargy, irritability, fever, cerebral edema

AUTOPSIES; CASE HISTORIES; CHILDREN; LEAD POISONING; METAL POISONING; BLOOD; LEAD; METALS; ACCIDENTAL POISONING; HEALTH HAZARDS; DELIBERATE EXPOSURE
Blank, E.; Howieson, J. 1983 Journal of the American Medical Association 249(16):2176-2177

Tissue	Cases Exposure Route	Range	Mean	General Information
9380 Blood	7378 Ingestion Inhalation	0.553-0.992 umol/l	0.738 umol/l	74(1%) >1.7 umol/l, one >3.0 umol/l Range of means for residents of 24 towns. Levels highest in town with soft water and high drinking water Pb. Levels increased by cigarette smoking and alcohol consumption. Estimated mean contribution to individual blood Pb: 9%, cigarettes, 8%, alcohol, 6%, Pb in drinking water 40-59 yr old men, Jan 1978-June 1980, UK AAS

UNITED KINGDOM; ADULTS; AGE; BLOOD; LEAD; METALS; ALCOHOLIC BEVERAGES; DRINKING WATER; SMOKING; DELIBERATE EXPOSURE; ENVIRONMENTAL EXPOSURE
Pocock, S.J.; Shaper, A.G.; Walker, M.; Wale, C.J.; Clayton, B.; Delves, T.; Lacey, R.F.; Packham, R.P.; Powell, P. 1983 Journal of Epidemiology and Community Health 37:1-7

Tissue	Cases Exposure Route	Range	Mean	General Information
9381 Blood	a) 143 b) 240 c) 200 d) 73 e) 100 f) 201 g) 200 h) 85 i) 206 j) 212 k) 180 l) 192	a) Not given b) Not given c) Not given d) Not given e) Not given f) Not given g) Not given h) Not given i) Not given j) Not given k) Not given l) Not given	a) 150 +or- 1.3 ug/l b) 64 +or- 1.4 ug/l c) 138 +or- 1.6 ug/l d) 179 +or- 1.6 ug/l e) 107 +or- 1.4 ug/l f) 82 +or- 1.5 ug/l g) 60 +or- 1.4 ug/l h) 225 +or- 1.4 ug/l i) 96 +or- 1.3 ug/l j) 72 +or- 1.5 ug/l k) 75 +or- 1.5 ug/l l) 92 +or- 1.6 ug/l Geometric means	a) Belgium, Brussels b) China, Beijing c) India, Ahmedabad d) India, Bangalore e) India, Calcutta f) Israel, Jerusalem g) Japan, Tokyo h) Mexico, Mexico City i) Peru, Lima j) Sweden, Stockholm k) United States, Baltimore l) Yugoslavia, Zagreb Level in men about 30% higher than women, smokers about 10% higher than nonsmokers. Elementary school teachers from urban areas. AAS

BELGIUM; CHINA; INDIA; ISRAEL; JAPAN; MARYLAND; MEXICO; PERU; SWEDEN; UNITED STATES; YUGOSLAVIA; ADULTS; AGE; AUTOPSIES; CHILDREN; SEX; BLOOD; KIDNEYS; COMPARATIVE EVALUATIONS; CADMIUM; LEAD ; METALS; BIOACCUMULATION; GASOLINE; POPULATION EXPOSURE; SMOKING; URBAN AREAS; ENVIRONMENTAL EXPOSURE
Friberg, L.; Vahter, M. 1983 Environmental Research 30:95-128

Lead
7439-92-1
Pb
AtW 207.2, MP 327.4 C, BP 1740 C, VP 1.77 mm Hg at 1000 C, 1 mm Hg at 970 C, 10 mm Hg at 1160 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9362 Blood	27,801	Not given	37% (5.4 ug/dl)	Average reduction in levels from Feb. 1976 through Feb. 1980 Significant ($P<0.001$) correlation between blood and gasoline levels 6 mo-74 yr olds from 64 areas of US AAS

UNITED STATES; ADOLESCENTS; ADULTS; CHILDREN; INFANTS; LEAD POISONING; BLOOD; COMPARATIVE EVALUATIONS; LEAD; ENVIRONMENTAL EXPOSURE
Annest, J.L.; Pirkle, J.L.; Makuc, D.; Neese, J.W.; Bayse, D.D.; Kovar, M.G. 1983 New England Journal of Medicine 308:1373-1377

Tissue	Cases Exposure Route	Range	Mean	General Information
9888 Blood	a) 27 b) 21 c) 15 d) 7	a) Not given b) Not given c) Not given d) Not given	a) 19+/-4 ug/dl b) 18+/-2 ug/dl c) 13+/-2 ug/dl d) 18+/-4 ug/dl S.E.	a) Essential hypertension and renal disease b) Essential hypertension, no renal disease c) Hypertension due to renal disease d) Renal disease, no hypertension No current occupational exposure. Possible exposure from industrial sources or from consumption of "moonshine" in 24 patients in a), 16 in b), 15 in c). No symptoms of acute poisoning. 28-70 yr olds, Veterans Hospital, New Jersey. 30 of the 48 patients with essential hypertension were black, had renal impairment. ASV

NEW JERSEY; ADULTS ; HYPERTENSION; LEAD POISONING; BLOOD; URINE; DISEASES; KIDNEYS; LEAD; ENVIRONMENTAL EXPOSURE
Batuman, V.; Landy, E.; Maesaka, J.K.; Wedeen, R.P. 1983 New England Journal of Medicine 309:17-21

Tissue	Cases Exposure Route	Range	Mean	General Information
9884 Blood	a) 102 b) 60 c) 72 d) 11 e) 19 f) 28 g) 26 h) 78	a) Not given b) Not given c) Not given d) Not given e) Not given f) Not given g) Not given h) Not given	a) 387+/-96 ug/l b) 342+/-100 ug/l c) 313+/-97 ug/l d) 211+/-69 ug/l e) 219+/-72 ug/l f) 206+/-94 ug/l g) 226+/-98 ug/l h) 253+/-85 ug/l	a) Alcoholic liver disease, no cirrhosis b) Compensated alcoholic cirrhosis c) Decompensated alcoholic cirrhosis d) Persistent hepatitis e) Active hepatitis f) Compensated viral or cryptogenic cirrhosis g) Decompensated viral or cryptogenic cirrhosis h) Controls Patients with chronic liver diseases. Men, mean age 35.4 +or- 10.6 to 54.4 +or- 11.5 yr, women, 44.7 +or- 16.8 to 63.6 +or- 12.8 yr. Italy AAS

ITALY; ADULTS; CIRRHOSIS; LIVER DISEASES; BLOOD; COMPARATIVE EVALUATIONS; LEAD; ALCOHOLISM; ENVIRONMENTAL EXPOSURE
Bortoli, A.; Mattiello, G.; Zotti, S.; Bonvicini, P.; Trabuio, G.; Fassin, G. 1983 International Archives of Occupational and Environmental Health 52:49-57

Lead
7439-92-1
Pb
AtW 207.2, MP 327.4 C, BP 1740 C, VP 1.77 mm Hg at 1000 C, 1 mm Hg at 970 C, 10 mm Hg at 1160 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9885 Blood		a) Not given b) Not given c) Not given d) Not given e) Not given f) Not given	a) 0.67+/-0.22 umol/l b) 0.73+/-0.27 umol/l c) 0.38+/-0.09 umol/l d) 0.43+/-0.14 umol/l e) 0.50+/-0.23 umol/l f) 0.59+/-0.31 umol/l	a) 1977 north b) 1978 north c) 1981 north d) 1981 south e) 1982 west f) 1982 north Wales AAS
BLOOD; COMPARATIVE EVALUATIONS; MEASUREMENT METHODS; ADULTS; UNITED KINGDOM; AUTOMOTIVE; FUEL ADDITIVES; FUMES; GASOLINE; CONSUMER EXPOSURE King, E. 1983 British Medical Journal 286:2059-2060				

Tissue	Cases Exposure Route	Range	Mean	General Information
9886 Blood	42	a) Not given b) Not given	a) 0.83+/-0.32 umol/l b) 0.55+/-0.16 umol/l	a) 1969 samples b) 1982 samples Wales
LEAD ; AUTOMOTIVE; FUEL ADDITIVES; FUMES; GASOLINE; COMPARATIVE EVALUATIONS; BLOOD; UNITED KINGDOM; ADULTS; CONSUMER EXPOSURE Elwood, P.C. 1983 British Medical Journal 286:1515				

Tissue	Cases Exposure Route	Range	Mean	General Information
9887 Blood	2 Ingestion	a) 45-27 ug/dl b) 50-137 ug/dl	a) Not given b) Not given	a) At 2 examinations, 10 days apart b) During Pb screening program and 2 mo later Unknown amounts of Asarcon (Pb-tetroxide) 4 mo old Mexican-American, 5.86 kg, CA, 29 mo old Mexican-American, CO Vomiting, diarrhea, weakness, malaise, jaundice. Abnormal temperature, pulse, respiration.
CALIFORNIA; COLORADO; CASE HISTORIES; CHILDREN; INFANTS; LEAD POISONING; BLOOD PLASMA; LEAD COMPOUNDS; ENVIRONMENTAL EXPOSURE Bose, A.; Vashistha, K.; O'Loughlin, B.J. 1983 Pediatrics 72(1):106-108				

Lead
7439-92-1
Pb
AtW 207.2, MP 327.4 C, BP 1740 C, VP 1.77 mm Hg at 1000 C, 1 mm Hg at 970 C, 10 mm Hg at 1160 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9888 Blood	a) 61 b) 80 c) 14 d) 11 e) 101 f) 29	a) Not given b) Not given c) Not given d) Not given e) Not given f) Not given	a) 14.8 ug/100 ml b) 12.8 ug/100 ml c) 10.5 ug/100 ml d) 10.2 ug/100 ml e) 10.5 ug/100 ml f) 7.7 ug/100 ml	a) Greenland males b) Greenland females c) Danes, in Greenland, males d) Danes, in Greenland, females e) Danes, in Denmark, males f) Danes, in Denmark, females 15-78 yr old Eskimoes (Greenland), controls (Danes) AAS

BLOOD; COMPARATIVE EVALUATIONS; DENMARK; GREENLAND; ADULTS; LEAD POISONING; LEAD; ENVIRONMENTAL EXPOSURE
Hansen, J.C.; Kromann, N.; Wulf, H.C.; Alboge, K. 1985 Science of the Total Environment 26:245-254

Tissue	Cases Exposure Route	Range	Mean	General Information
9889 Blood	83	6.8-33.8 ug/dl	14.8 ug/dl Geometric mean	Measure of current exposure. Mean age 9.4 yr, range 7.1-12.1 yr. Residents of Pb-smelter area, Stalberg, FRG. 8-12/80 AAS

TEETH; BLOOD; ENVIRONMENTAL EXPOSURE; GERMANY; CHILDREN; EXPERIMENTAL PSYCHOLOGY; LEAD; AIR POLLUTION; INDUSTRIAL AREAS; INDUSTRIAL POLLUTION; LAND POLLUTION; SMELTERS
Winneke, G.; Kramer, U.; Brockhaus, A.; Ewers, U.; Kujanek, G.; Lechner, H.; Janke, W. 1983 International Archives of Occupational and Environmental Health 5:231-252

Tissue	Cases Exposure Route	Range	Mean	General Information
9890 Blood	a) 38 b) 23	a) Not given b) Not given	a) 27.9+/-7.7 ug/100 ml b) 19.7+/-5.5 ug/100 ml	a) Subjects with past Pb-exposure b) Controls 38 workers, 23-71 (mean 52) yr old, exposed 1-444 (mean 83) mo, time since exposure 36-324 (mean 145) mo. 23 controls, 26-72 (mean 50) yr old. Padova, Italy Elevated erythrocyte protoporphyrin. Changes in electro-myographic parameters Lowered max motor conduction velocity, slow-fiber conduction velocity - ulnar, peroneal nerves. Partial denervation in two AAS

LEAD; BLOOD; URINE; OCCUPATIONAL EXPOSURE; METALS; ITALY; NEUROLOGIC MANIFESTATIONS; OCCUPATIONAL HAZARDS
Corsi, G.; Bartolucci, G.B.; Pardin, P.; Negrin, P.; Manzoni, S. 1984 American Journal of Industrial Medicine 6:281-290

Lead
7439-92-1
Pb
AtW 207.2, MP 327.4 C, BP 1740 C, VP 1.77 mm Hg at 1000 C, 1 mm Hg at 970 C, 10 mm Hg at 1160 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9591 Blood	19	a) <10-17.0 mg b) 25-51 mg c) 38-49 mg /100 mg	a) 12.2+/-3.3 mg b) 34.4+/-7.2 mg c) 41.0+/-4.6 mg	a) Controls. Research and development, laboratory and medical department workers, 4 cases b) Assembly department workers, 11 cases c) Pastig department workers, 5 cases Zinc-protoporphyrin levels given. Air levels: 1.6 ug/C4 M (controls)-164.8 ug/cu M (assembly workers). Highest level on face was 605 ug and hands was 14032.5 ug. 23-62 yr old storage battery manufacturing plant workers
BLOOD; OCCUPATIONAL EXPOSURE; ADULTS; LEAD; INDUSTRIAL PLANTS; METALS Chavalitnitikul, C.; Levin, L.; Chen, L.-C. 1984 American Industrial Hygiene Association Journal 45(12):802-808				

Tissue	Cases Exposure Route	Range	Mean	General Information
9592 Blood				Review. Major system and organ response to intoxication, particularly at low tissue levels, discussed. Clinical aspects emphasized.
BLOOD; ERYTHROCYTES; GASTROINTESTINAL SYSTEM; LIVER; MUSCULOSKELETAL SYSTEM; KIDNEYS; SEMEN; TESTES; THYROID GLANDS; REVIEW; ENVIRONMENTAL EXPOSURE; LEAD POISONING; LEAD; HEALTH HAZARDS Cullen, M.R.; Robins, J.M.; Eskenasi, B. 1983 Medicine 62(4):221-247				

Tissue	Cases Exposure Route	Range	Mean	General Information
9593 Blood	14	a) Not given b) Not given c) Not given d) Not given e) Not given f) Not given	a) 38.6+/-5.2 ug/dl b) 38.5+/-5.2 ug/dl c) 33.3+/-3.6 ug/dl d) 38.7+/-7.6 ug/dl e) 31.7+/-2.6 ug/dl f) 37.8+/-7.9 ug/dl	a) Before dust control in homes b) 35 controls c) After 6 mo, 2X/mo wet-mopping d) After 6 mo, controls e) After 12 mo, 2X/mo wet-mopping f) After 12 mo, controls Initial home levels >100 ug/930 sq cm. 18-70 mo olds with Class II or III Pb poisoning Decrease of free erythrocyte protoporphyrin ASV
ENVIRONMENTAL EXPOSURE; MARYLAND; CHILDREN; LEAD POISONING; BLOOD; COMPARATIVE EVALUATIONS; LEAD; BIOACCUMULATION; DUST; URBAN AREAS Charney, E.; Kessler, B.; Farfel, M.; Jackson, D. 1983 New England Journal of Medicine 309(18):1089-1093				

Lead
7439-92-1
Pb
AtW 207.2, MP 327.4 C, BP 1740 C, VP 1.77 mm Hg at 1000 C, 1 mm Hg at 970 C, 10 mm Hg at 1160 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9804 Blood	a) 54 b) 72 c) 16 d) 53	a) 7-81 ug/ml b) 5-15 ug/ml c) 7-21 ug/ml d) 4-15 ug/ml	a) 13.1 ug/ml b) 8.2 ug/ml c) 11.5 ug/ml d) 7.9 ug/ml Geometric means	a) Rotterdam, inner city b) Rotterdam, suburb c) The Hague d) Zoetermeer Significant difference between inner city and suburb ($p<0.001$). 4-6 yr olds, participants of European Communities 1981 survey AAS

ENVIRONMENTAL EXPOSURE; COMPARATIVE EVALUATIONS; NETHERLANDS; CHILDREN; BLOOD; LEAD; AIR POLLUTION; BIOACCUMULATION; URBAN AREAS
Brunekreef, B.; Noy, D.; Biersteker, K.; Boleij, J. 1983 Journal of the Air Pollution Control Association 33(9):872-876

Tissue	Cases Exposure Route	Range	Mean	General Information
9805 Blood	a) 50 b) 50	a) 85-256 ug/ml b) 78-215 ug/ml	a) 156.6 ug/ml b) 138.3 ug/ml	a) Mentally retarded children b) Normal children. 10-17 (mean 13.36) yr olds in institute for handicapped and 10-17 (mean 13.36) yr olds in orphanage, Zagreb, Yugoslavia AAS

BLOOD; ENVIRONMENTAL EXPOSURE; YUGOSLAVIA; CHILDREN; ADOLESCENTS; MENTAL RETARDATION; LEAD
Telisman, S.; Prpic-Majic, D.; Beritic, T. 1983 International Archives of Occupational and Environmental Health 52:361-369

Tissue	Cases Exposure Route	Range	Mean	General Information
9806 Blood	850	a) Not given b) Not given c) Not given d) Not given e) Not given f) Not given g) Not given h) Not given i) Not given j) Not given k) Not given	a) 22+/-10 ug b) 22+/-10 ug c) 20+/-8 ug d) 47+/-10 ug e) 18+/-7 ug f) 21+/-8 ug g) 26+/-13 ug h) 23+/-10 ug i) 21+/-9 ug j) 28+/-13 ug k) 21+/-9 ug /100 ml	a) All samples, 1980-81 b) Males, 510 cases c) Females, 320 cases d) Printing workers, 25 cases e) Age 20 yr, 106 cases f) Age 40 yr, 55 cases g) Age 60 yr, 26 cases h) Smokers, 167 cases i) Non-smokers, 663 cases j) City center, 91 cases k) Other locations, 730 cases Summary of more extensive data. Tehran, Iran citizens, 20-60 yr AAS

BLOOD; ENVIRONMENTAL EXPOSURE; OCCUPATIONAL EXPOSURE; IRAN; ADULTS; AGE; COMPARATIVE EVALUATIONS; LEAD; METALS; BIOLOGICAL MONITORING; OCCUPATIONAL HAZARDS; POPULATION EXPOSURE; URBAN AREAS; PRINTING INDUSTRY; SMOKING
Ghafourian, H.; Rahimi, H.; Banisadr, A.; Shahiesvandi, K.; Bayat, I. 1983 International Journal of Environmental Studies 21:309-316

Lead
7439-92-1
Pb
AtW 207.2, MP 327.4 C, BP 1740 C, VP 1.77 mm Hg at 1000 C, 1 mm Hg at 970 C, 10 mm Hg at 1160 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9897 Blood	a) 61 b) 80 c) 77	a) Not given b) >/=1.4-</=1.9 umol/l c) >1.9-</=2.9 umol/l	a) >/=1.2 umol/l b) Not applicable c) Not applicable	a) Low level reference group b) Slightly elevated c) Moderately elevated Sampled 10-15X over 3 yr period. Ranges of means. 5-6 yr old patients, Chicago Dept of Health 8/76-2/77. African-, Latin-, and Euro-American origins, poor neighborhoods. Decreased performance on psychological tests. AAS
BLOOD; ENVIRONMENTAL EXPOSURE; ILLINOIS; CHILDREN; LEAD POISONING; LEAD; BIOLOGICAL MONITORING; BIOACCUMULATION; PICA; URBAN AREAS; LEARNING DISABILITIES; MENTAL RETARDATION Odenbro, A.; Greenberg, N.; Vroegh, K.; Bederka, J.; Kihlstrom, J. 1983 Ambio XII(1):40-44				

Tissue	Cases Exposure Route	Range	Mean	General Information
9898 Blood, cells	2 Injection	Not given	Approx 46-50%/um	60 min after 20 uCi iv as Pb-203 chloride. Little change over next 2 wk. Daily whole body scans indicate half-life of 72.7 d. Healthy 24 yr olds, normal renal function Echo scanner
BLOOD PLASMA; ERYTHROCYTES; URINE; DELIBERATE EXPOSURE; LEAD; UNITED KINGDOM Campbell, B.C.; Meredith, P.A.; Moore, M.R.; Watson, W.S. 1984 Toxicology Letters 21:331-335				

Tissue	Cases Exposure Route	Range	Mean	General Information
9899 Blood, cells	7	a) 90-238 ug/dl b) 90-200 ug/dl c) 91-200 ug/dl d) 75-175 ug/dl e) 95-175 ug/dl f) 77-160 ug/dl	a) 140 ug/dl b) 135 ug/dl c) 135 ug/dl d) 120 ug/dl e) 130 ug/dl f) 115 ug/dl	a) 0 hr b) 0.5 hr c) 1.5 hr d) 3 hr e) 5 hr f) 24 hr After start of 20 mg/kg CaEDTA IV infusion over 1 hr. Estimated from graph. Adults with blood Pb 46-67 ug/100 g, 46-59 yr, employed at gun metal foundry 6-14 yr AAS
BLOOD; BLOOD PLASMA; ERYTHROCYTES; URINE; OCCUPATIONAL EXPOSURE; ADULTS; LEAD; ZINC Araki, S.; Aono, H.; Fukahori, M.; Tabuki, K. 1984 Archives of Environmental Health 39(5):363-367				

Lead
7439-92-1
Pb
AtW 207.2, MP 327.4 C, BP 1740 C, VP 1.77 mm Hg at 1000 C, 1 mm Hg at 970 C, 10 mm Hg at 1160 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9400 Blood, cells				Review. Major system and organ response to intoxication, particularly at low tissue levels, discussed. Clinical aspects emphasized.
BLOOD; ERYTHROCYTES; GASTROINTESTINAL SYSTEM; LIVER; MUSCULOSKELETAL SYSTEM; KIDNEYS; SEMEN; TESTES; THYROID GLANDS; REVIEW; ENVIRONMENTAL EXPOSURE; LEAD POISONING; LEAD; HEALTH HAZARDS Cullen, M.R.; Robins, J.M.; Eskenazi, B. 1988 Medicine 62(4):221-247				

Tissue	Cases Exposure Route	Range	Mean	General Information
9401 Blood, fetal	a) 500 b) 500	a) Not given b) Not given	a) 5 ug/dl b) 1.5 ug/dl	a) August 1979 b) April 1981 Umbilical cord blood. Levels positively correlated with sales of leaded gasoline in MA for 0-2 mo after birth ($p<0.001$) Births, Boston, MA hospital
MASSACHUSETTS; NEWBORN; BLOOD; LEAD; METALS; BIOACCUMULATION; DRINKING WATER; GASOLINE; ENVIRONMENTAL EXPOSURE Rabinowitz, M.; Needleman, H.L. 1988 Lancet 1(8314-8315):68				

Tissue	Cases Exposure Route	Range	Mean	General Information
9402 Blood, plasma	3 Injection	Not given	Approx 2-3%/um	60 min after 20 uCi as Pb-203 chloride, iv. Rapid recirculating flux through plasma and other exchangeable compartments indicated. Daily whole body scans indicate half-life of 72.7 d. Healthy 24 yr olds, normal renal function Echo scanner
BLOOD PLASMA; ERYTHROCYTES; URINE; DELIBERATE EXPOSURE; LEAD; UNITED KINGDOM Campbell, B.C.; Meredith, P.A.; Moore, M.R.; Watson, W.S. 1984 Toxicology Letters 21:281-285				

Tissue	Cases Exposure Route	Range	Mean	General Information
9403 Blood, plasma	a) 204 b) 38 c) 153 d) 467 e) 212 Inhalation Ingestion	a) 10.8-69.8 ug/dl b) 9.9-22.7 ug/dl c) 12.8-63.0 ug/dl d) 8.2-62.9 ug/dl e) 10.2-44.5 ug/dl	a) 25.6+/-0.6 ug/dl b) 14.6+/-0.5 ug/dl c) 26.3+/-0.7 ug/dl d) 22.2+/-0.3 ug/dl e) 19.5+/-0.04 ug/dl	a) Children exposed in mixed urban location b) Children exposed in suburban locations c) Adolescents exposed in urban commerical location d) Adolescents exposed in mixed urban locations e) Adolescents exposed in suburban setting Data reported originally in 1977. Study proposes new mathematical model. 242 children 1-5 yr olds. 852 adolescents, 6-18 yr old.
BLOOD PLASMA; ENVIRONMENTAL EXPOSURE; CHILDREN; ADOLESCENTS; LEAD POISONING; LEAD; AIR POLLUTION; BIOACCUMULATION; HEALTH HAZARDS; INDUSTRIAL AREAS; INDUSTRIAL EMISSIONS; INDUSTRIAL POLLUTION; LAND POLLUTION; POPULATION EXPOSURE; WATER POLLUTION Angle, C.R.; Marcus, A.; Cheng, I.-H.; McIntire, M.S. 1984 Environmental Research 35:160-170				

Lead
7439-92-1
Pb
AtW 207.2, MP 327.4 C, BP 1740 C, VP 1.77 mm Hg at 1000 C, 1 mm Hg at 970 C, 10 mm Hg at 1160 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9404 Blood, plasma	10 Injection	1.0-1.0 ug/dl	Not applicable	0-24 hr, peak (4.5 ug/dl) at 3 hr after 1-h IV infusion of 20 mg EDTA/kg in 5% glucose range of means. Gun metal founders employed at factory 7-15 yr. Mean age 51 yr. AAS
URINE; BLOOD PLASMA; OCCUPATIONAL EXPOSURE; JAPAN; ADULTS; METAL POISONING; LEAD POISONING; COPPER; LEAD; ZINC; METALS; BIOACCUMULATION; INDUSTRIAL POLLUTION; BIOCONCENTRATION Aono, H.; Araki, S. 1984 International Archives of Occupational and Environmental Health 55:13-18				

Tissue	Cases Exposure Route	Range	Mean	General Information
9405 Blood, plasma	7	a) 1.0-2.8 ug/dl b) 2.8-6.5 ug/dl c) 4.4-8.3 ug/dl d) 3.0-6.9 ug/dl e) 2.5-4.7 ug/dl f) 0.66-3.0 ug/dl	a) 1.7 ug/dl b) 4.45 ug/dl c) 6.05 ug/dl d) 5.0 ug/dl e) 3.4 ug/dl f) 1.25 ug/dl	a) 0 hr b) 0.5 hr c) 1.5 hr d) 3 hr e) 5 hr f) 24 hr After start of 20 mg/kg CaEDTA IV infusion over 1 hr. Estimated from graph. Adults with blood Pb 46-67 ug/100 g, 46-59 yr, employed at gun metal foundry 6-14 yr AAS
BLOOD; BLOOD PLASMA; ERYTHROCYTES; URINE; OCCUPATIONAL EXPOSURE; ADULTS; LEAD; ZINC Araki, S.; Aono, H.; Fukahori, M.; Tabuki, K. 1984 Archives of Environmental Health 39(5):363-367				

Tissue	Cases Exposure Route	Range	Mean	General Information
9406 Blood, plasma		a) Not given b) Not given c) Not given	a) 0.018+/-0.003 ug/mL b) 0.018+/-0.006 ug/mL c) 0.018+/-0.003 ug/mL	a) Insulin-treated diabetics b) Non-insulin-treated diabetics c) Control non-diabetics Collected after overnight fasting. Significant differences between a), c) and b), c). 18-78 yr olds, Oxford, England NA; AAS
BLOOD PLASMA; ENGLAND; DIABETES; METABOLISM; MINERAL METABOLISM; ALUMINUM; ANTIMONY; ARSENIC; BARIUM; BROMINE; CADMIUM; CALCIUM; CESIUM; CHROMIUM; COBALT; COPPER; IODINE; IRON; LEAD; MAGNESIUM; MANGANESE; MERCURY; MOLYBDENUM; NICKEL; RUBIDIUM; SCANDIUM; SELENIUM; SILVER; TIN; VANADIUM; ZINC Ward, N.I.; Pim, B. 1984 Biological Trace Element Research 6:469-487				

Lead
7439-92-1
Pb
AtW 207.2, MP 327.4 C, BP 1740 C, VP 1.77 mm Hg at 1000 C, 1 mm Hg at 970 C, 10 mm Hg at 1160 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9407 Blood, whole	28 Ingestion	Not given	138 ug/l	Absorption correlated with concentration in blood Healthy, elderly, nonsmokers, 11 males, 12 females, age 69-85, England AAS
BLOOD SERUM; URINE; ENGLAND; CADMIUM; IRON; LEAD; DIETS; AGE; ENVIRONMENTAL EXPOSURE Bunker, V.W.; Lawson, M.S.; Delves, H.T.; Clayton, B.E. 1984 American Journal of Clinical Nutrition 39:803-808				

Tissue	Cases Exposure Route	Range	Mean	General Information
9408 Blood, whole	7	30-139 ug/dl	Not given	Exposures of 5 wk to 15 yr, at workplace or avocationally. Endocrine and reproductive function evaluated. After 2-6 mo chelation therapy, levels <30 ug/dl. 22-43 yr old victims of symptomatic occupational Pb intoxication, Connecticut Gastrointestinal, central nervous system, renal, blood, and reproductive problems Abnormal adrenocortical and germinal functions in most. AAS
BLOOD; ENVIRONMENTAL EXPOSURE; OCCUPATIONAL EXPOSURE; CONNECTICUT; CASE HISTORIES; CENTRAL NERVOUS SYSTEM DISEASES; LEAD POISONING; NEUROLOGIC MANIFESTATIONS; OCCUPATIONAL DISEASES; LEAD; FOUNDRIES; HEALTH HAZARDS; INDUSTRIAL PLANTS; OCCUPATIONAL HAZARDS; PAINTS; SPERM Cullen, M.R.; Kayne, R.D.; Robins, J.M 1984 Archives of Environmental Health 39(6):431-440				

Tissue	Cases Exposure Route	Range	Mean	General Information
9409 Blood, whole	72 Inhalation	a) 37.6-77.8 ug b) 47.5-76.6 ug c) 38.9-76.4 ug d) 39.5-77.5 ug e) 41.3-71.8 ug f) 30.0-61.0 ug g) 36.3-61.3 ug h) 36.7-60.8 ug /100 ml	a) 60.0+/-9.7 ug b) 58.8+/-7.6 ug c) 64.7+/-9.4 ug d) 60.4+/-8.8 ug e) 53.3+/-8.4 ug f) 49.3+/-6.1 ug g) 50.8+/-8.7 ug h) 50.6+/-8.0 ug /100 ml	a) Controls, 0 wks, 27 cases b) Controls, 16 wks, 27 cases c) Vitamin C treatment, 0 wks, 25 cases d) Vitamin C treatment, 16 wks, 25 cases e) Controls, 0 wks, 10 cases f) Controls, 8 wks, 10 cases g) Zinc treatment, 0 wks, 10 cases h) Zn treatment, 8 wks, 10 cases Vitamin C dose was 1 g/d, 5 d/wk. Zinc as Zn glutamate dose was 60 mg/d, 5 d/wk. No significant difference between control and treatment groups. 21-64 yr old workers at primary Pb smelter, 0.5-42 years exposure AAS
BLOOD; URINE; OCCUPATIONAL EXPOSURE; ADULTS; LEAD POISONING; METAL POISONING; INDUSTRIAL MEDICINE; CADMIUM; LEAD; MERCURY; ZINC; BIOACCUMULATION; HEALTH HAZARDS; INDUSTRIAL ATMOSPHERES; INDUSTRIAL PLANTS; INHALATION; OCCUPATIONAL HAZARDS; VITAMINS; VITAMIN C Lauwerys, R.; Roels, H.; Buchet, J.-P.; Bernard, A.A.; Verhoeven, L.; Konings, J. 1983 Journal of Occupational Medicine 25(9): 668-676				

Lead
7439-92-1
Pb
AtW 207.2, MP 327.4 C, BP 1740 C, VP 1.77 mm Hg at 1000 C, 1 mm Hg at 970 C, 10 mm Hg at 1160 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9410 Blood, whole	7	a) 46-67 ug/dl b) 40-68 ug/dl c) 40-68 ug/dl d) 39-68 ug/dl e) 42-65 ug/dl f) 36-65 ug/dl	a) 53 ug/dl b) 52 ug/dl c) 52.5 ug/dl d) 52 ug/dl e) 53 ug/dl f) 52.5 ug/dl	a) 0 hr b) 0.5 hr c) 1.5 hr d) 3 hr e) 5 hr f) 24 hr After start of 20 mg/kg CaEDTA IV infusion over 1 hr. Estimated from graph. Adults with blood Pb 46-67 ug/100 g, 46-59 yr, employed at gun metal foundry 6-14 yr AAS
BLOOD; BLOOD PLASMA; ERYTHROCYTES; URINE; OCCUPATIONAL EXPOSURE; ADULTS; LEAD; ZINC Araki, S.; Aono, H.; Fukahori, M.; Tabuki, K. 1984 Archives of Environmental Health 39(5):363-367				

Tissue	Cases Exposure Route	Range	Mean	General Information
9411 Blood, whole	31 Inhalation Ingestion	41-117 ug/dl	62 ug/dl	Occupational exposure. Patients treated by removal from further exposure and, in 10, chelation with 1 g EDTA IV t.i.d. for 2-3 d. 7 received 250 mg penicillamine oral q.i.d. for up to 5 mo. Patients at Yale Occupational Medicine Program, 30 males, 1 female, 22-65 yr old, 14 Caucasian, 16 Negros, 1 Hispanic. Abdominal pain, fatigue, arthralgia, decreased libido, headache, irritability, impotence, depression, anorexia, muscle pain, low back pain, muscle weakness, changed bowel habits, wt loss, paresthesia AAS
BLOOD; ENVIRONMENTAL EXPOSURE; ADULTS; CONNECTICUT; LEAD POISONING; LEAD; ACCIDENTAL POISONING; BIOACCUMULATION; HEALTH HAZARDS; INDUSTRIAL PLANTS; INDUSTRIAL POLLUTION; PAINTS; OCCUPATIONAL HAZARDS Cullen, M.R.; Robins, J.M.; Eskenazi, B. 1983 Medicine 62(4):221-247				

Tissue	Cases Exposure Route	Range	Mean	General Information
9412 Blood, whole	a) 55 b) 54 c) 136 d) 104 e) 155 f) 138 g) 150 h) 164	a) 0.020-0.255 mg/l b) 0.020-0.260 mg/l c) 0.040-0.275 mg/l d) 0.035-0.255 mg/l e) 0.025-0.310 mg/l f) 0.020-0.400 mg/l g) 0.020-0.255 mg/l h) 0.020-0.275 mg/l	a) 0.110 mg/l b) 0.115 mg/l c) 0.120 mg/l d) 0.100 mg/l e) 0.105 mg/l f) 0.100 mg/l g) 0.125 mg/l h) 0.115 mg/l Medians	a) 2-3 yr old males b) 2-3 yr old females c) 4-5 yr old males d) 4-5 yr old females e) 9 yr old males f) 9 yr old females g) 12 yr old males h) 12 yr old females Levels independent of age and sex. Means in general population 100-300 ng/ml. Cd levels below detection limit 0.50 ng/ml. 2-12 yr olds, Kamloops, British, Columbia AAS
BLOOD; CHILDREN; COPPER; LEAD; ZINC; SEX; AGE; COMPARATIVE EVALUATIONS Subramanian, K.S.; Meranger, J.C. 1983 Science of the Total Environment 30:231-244				

Lead
7439-92-1
Pb
AtW 207.2, MP 327.4 C, BP 1740 C, VP 1.77 mm Hg at 1000 C, 1 mm Hg at 970 C, 10 mm Hg at 1160 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9413 Body	Ingestion	a) 37-56% b) 5-15% c) 28-26% d) 11.1-23.3% e) 1.8-13.6% f) Not given g) Not given h) Not given % of dose	a) 44+/-6% b) 10+/-1% c) 13.9+/-2.3% d) 19.4+/-2.8% e) 5.5+/-1.2% f) 30% g) 7% h) 16% % of dose	a) 1 uCi Pb-203 in water. Fasted 12 hr before and 2.25 hr after dose, 2 cases b) 1 uCi Pb-203 in water followed by 50 ml water with 200 mg Ca-carbonate and 140 mg Na-dihydiogen phosphate, 8 cases c) 1 uCi Pb-203 with 15 ug Pb-chloride with tea or coffee before meal d) 1 uCi Pb-203 with half pint beer before meal e) Spinach (0.8 uCi Pb-203/plant) with normal meal, 9 cases f) 1 uCi Pb-203 10 min before lunch, 1 case g) During lunch, separate occasion, same case h) 10 min after lunch, separate occasion, same case. Volunteers

BODY; DELIBERATE EXPOSURE; LEAD; COMPARATIVE EVALUATIONS
Heard, M.J.; Chamberlain, A.C. 1983 Science of the Total Environment 30:245-253

Tissue	Cases Exposure Route	Range	Mean	General Information
9414 Bone	1	Not given	6.0+/-3.6 ppm Dry wt	Lumbar vertebrae (n=8). Chromate plating worker, employed 7 yr, died at age 66, 30 yr after changing jobs ES

AORTA; VERTEBRAE; BONES; ENVIRONMENTAL EXPOSURE; OCCUPATIONAL EXPOSURE; JAPAN; AUTOPSIES; CADAVERS; CARDIOVASCULAR DISEASES; MINERALS; BIOACCUMULATION; DIETS; FOODS; MINERAL DEPOSITS; CALCIUM; PHOSPHORUS; IRON; MAGNESIUM; ZINC; ALUMINUM; COPPER; CADMIUM; LEAD; NICKEL; VANADIUM; CHROMIUM; MANGANESE; SILICON; TIN; TITANIUM; STRONTIUM
Terada, H. 1984 Archives of Environmental Contamination and Toxicology 13:119-127

Tissue	Cases Exposure Route	Range	Mean	General Information
9415 Bone	a) 75 b) 32 Inhalation Dermal	a) <20-122 ug/g b) <20-135 ug/g	a) 48 ug/g b) 59 ug/g medians	a) Active workers b) Retired workers. Undetermined dose. Active workers, 19-65 yr old, 10 yr mean exposure. Retired 53-80 yr olds, 24 yr mean exposure. Exposed: smelter workers, brass founders, scrappers, storage-battery workers, painters. X-ray fluores

BONE; BLOOD; OCCUPATIONAL EXPOSURE; ADULTS; SWEDEN; INDUSTRIAL HYGIENE; INDUSTRIAL MEDICINE; LEAD; BIOACCUMULATION; INDUSTRIAL PLANTS; METAL POISONING
Christoffersson, J.O.; Schutz, A.; Ahlgren, L.; Haeger-Aronsen, B.; Mattsson, S.; Skerfving, S. 1984 American Journal of Industrial Medicine 6:447-457

Lead
7439-92-1
Pb
AtW 207.2, MP 327.4 C, BP 1740 C, VP 1.77 mm Hg at 1000 C, 1 mm Hg at 970 C, 10 mm Hg at 1160 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9416 Brain	2	a) Not applicable b) Not applicable	a) 0.60 ppm b) 0.02 ppm	a) Healthy 36 yr old man died about 5 days after smelting 182 kg lead for 24 hr in enclosed environment b) Control, 60 yr old man without renal disease Autopsies. AAS
BLOOD; BRAIN; HEART; INTESTINES; KIDNEYS; LIVER; LUNGS; MUSCLES; SKIN; SPLEEN; STOMACH; URINE; ENVIRONMENTAL EXPOSURE; UNITED KINGDOM; ADULTS; AUTOPSIES; METAL POISONING; CADMIUM; LEAD; INHALATION Taylor, A.; Jackson, M.A.; Patil, D.; Burston, J.; Lee, H.A. 1984 British Medical Journal 288:1270-1271				

Tissue	Cases Exposure Route	Range	Mean	General Information
9417 Breast	22	a) Not given b) Not given	a) 1.33+/-0.66 ug/g b) 1.55+/-1.24 ug/g	a) Normal tissue b) Neoplastic Dry wt, 8 samples, p=0.28 Patients with primary breast carcinoma, samples of normal and neoplastic tissue obtained at time of mastectomy X-ray fluores
BREAST; CALCIUM; VANADIUM; CHROMIUM; MANGANESE; IRON; NICKEL; COPPER; ZINC; ARSENIC; SELENIUM; BROMINE; RUBIDIUM; STRONTIUM; MOLYBDENUM; LEAD; MERCURY; NEOPLASMS Risk, S.L.; Sky-Peck, H.H. 1984 Cancer Research 44:5300-5304				

Tissue	Cases Exposure Route	Range	Mean	General Information
9418 Cerebrospinal fluid	a) 10 b) 8 c) 3 d) 6 e) 3 f) 1 g) 1	a) Not given b) Not given c) Not given d) Not given e) Not given f) Not given g) Not given	a) 15.7+/-11.5 ug/l b) 16.3+/-9.0 ug/l c) 11.0+/-1.1 ug/l d) 29.9+/-15.2 ug/l e) 40.8+/-27.7 ug/l f) 24.8 ug/l g) 15.0 ug/l	a) Controls, non-neoplasmic diseases (hydrocephalus, etc.) b) Meningioma c) Craniopharyngioma d) Astrocytoma e) Medulloblastoma f) Pinealblastoma g) Chondrosarcoma b, c) Benign brain tumors, (d-g) malignant brain tumors Significant differences between malignant tumor and control groups ($p<0.047$), and between malignant and benign tumor groups ($p<0.014$). Relationship, if any, to malignancy unknown. Patients, 18 men, 14 women, range of mean ages 4.6-55.0 yr, fasted 8-12 hr AAS
CEREBROSPINAL FLUID; SAUDI ARABIA; CARCINOMAS; NEOPLASMS; SARCOMAS; ALUMINUM; ANTIMONY; BISMUTH; CADMIUM; COPPER; GOLD; LEAD; SELENIUM; SILVER El-Yazigi, A.; Al-Saleh, I.; Al-Mefty, O. 1984 Clinical Chemistry 30:1358-1360				

Lead
7439-92-1
Pb
AtW 207.2, MP 327.4 C, BP 1740 C, VP 1.77 mm Hg at 1000 C, 1 mm Hg at 970 C, 10 mm Hg at 1160 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9419 Hair	a) 82 b) 85 c) 52 d) 64	a) 2-1166 ppm b) 2-161 ppm c) 0-497 ppm d) 0-67 ppm	a) 90.3 ppm b) 22.3 ppm c) 28.9 ppm d) 13.3 ppm	a) Santo Amaro b) Sao Braz c) Sao Francisco d) Controls, Guaibim Significantly higher levels in a)-c), $p<0.00005$, <0.0005, <0.01, respectively. Levels higher closer to smelter. 18-77 yr old fishermen from 3 riverside towns of the Subae River Basin in Brazil. Primary smelter (Santa Amaro) heavily pollutes river & air. Controls from Guaibim AAS
LEAD; CADMIUM; WATER POLLUTION; ENVIRONMENTAL EXPOSURE; OCCUPATIONAL EXPOSURE; HAIR; BRAZIL; AIR POLLUTION; SMELTERS Carvalho, F.; Tavares, T.M.,; Souza, S.P.; Linhares, P.S. 1984 Environmental Research 33:300-306				

Tissue	Cases Exposure Route	Range	Mean	General Information
9420 Hair	a) 26 b) 26 c) 28 d) 28	a) 0.9-14.4 ppm b) <0.8-40.9 ppm c) 2.0-54.8 ppm d) <0.8-45.8 ppm	a) 6.0 ppm b) 5.3 ppm c) 13.8 ppm d) 7.2 ppm Geometric	a) Mothers, controls b) Newborn, controls c) Mothers, exposed d) Newborn, exposed Ranges estimated from graph of cumulative frequency distribution. Differences between controls, exposed mothers were significant - $p<0.01$. Levels for individual maternal/newborn samples not significantly correlated. Mothers occupationally exposed to heavy metals. Newborns. Matched controls. Rural area of eastern France. No adverse effects to newborns noted.
LEAD; CADMIUM; HAIR; NEWBORN; OCCUPATIONAL EXPOSURE; METALS; FRANCE; ADULTS; AGE Huel, G.; Everson, R.B.; Menger, I. 1984 Environmental Research 35:115-121				

Tissue	Cases Exposure Route	Range	Mean	General Information
9421 Hair	80	103-8128 ng/g	2002+/-1615 ng/g	No significant relationships with levels in blood or milk, or with locations Lactating 22-47 yr olds, rural and urban areas, Tucson, AZ AAS
LEAD; BLOOD; MILK; HAIR; LACTATION; RURAL AREAS; URBAN AREAS; ENVIRONMENTAL EXPOSURE Rockway, S.W.; Weber, C.W.; Lei, K.Y.; Kemberling, S.R. 1984 International Archives of Occupational and Environmental Health 53:181-187				

Lead
7439-92-1
Pb
AtW 207.2, MP 327.4 C, BP 1740 C, VP 1.77 mm Hg at 1000 C, 1 mm Hg at 970 C, 10 mm Hg at 1160 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9422 Hair	a) 181 b) 24	a) 3-601 ppm b) 1-40 ppm	a) 43 ppm b) 17 ppm	a) Pottery workers b) Controls Workers from Tlaquepaque and Tonala, Mexico. Controls from Tuscon, Arizona AAS
HAIR; OCCUPATIONAL EXPOSURE; ARIZONA; MEXICO; ADULTS; LEAD; CADMIUM; ARSENIC; VANADIUM; GOLD; ZINC; COPPER; IRON; MANGANESE; POTASSIUM Weber, C.W.; Nelson, G.W.; deVaquera, M.V.; Pearson, P.B. 1984 Nutrition Reports International 30(5):1009-1018				

Tissue	Cases Exposure Route	Range	Mean	General Information
9423 Hair		a) Not given b) Not given c) 19-45 ug/g d) Not given e) Not given f) Not given g) Not given	a) 52 ug/g b) 42 ug/g c) Not given d) 17 ug/g e) 5 ug/g f) 4 ug/g g) 3 ug/g	a) Nigeria b) Kenya c) US, some parts d) Canada e) Countries such as India (rural) f) Bangladesh g) Iran Levels from database containing data on "normal" levels of 15 elements in 7 tissues/fluids. Data selected by 60 investigators in over 40 countries. Diet, environment both important in distribution of elements.
ZINC; COPPER; MANGANESE; SELENIUM; LEAD; CADMIUM; BLOOD; BLOOD SERUM; HAIR; MILK; BANGLADESH; INDIA; TURKEY; FINLAND; ITALY; NEW ZEALAND; GUATEMALA; CHILE; SWEDEN; HUNGARY; YUGOSLAVIA; POLAND; KENYA; EGYPT; SOUTH AFRICA; UNITED STATES; AUSTRALIA; GREECE; PAKISTAN; NIGERIA; PHILIPPINES; ZAIRE; THAILAND; CHINA; WYOMING; OHIO; CALIFORNIA; JAPAN; MEXICO; CANADA; ISRAEL; PERU; SPAIN; COMPARATIVE EVALUATIONS; BIOLOGICAL MONITORING; IRAN; DIETS; ENVIRONMENTAL EXPOSURE Iyengar, G.V. 1984 Science of the Total Environment 38:125-131				

Tissue	Cases Exposure Route	Range	Mean	General Information
9424 Hair	54	a) Not given b) Not given	a) 54+/-12 ppm b) 22+/-6 ppm	a) Hypertensives b) Controls Statistically significant ($p \leq 0.05$) 20 adult black females classified as hypertensive, 14 adult black normotensive females Graphite furnace
HAIR; ENVIRONMENTAL EXPOSURE; MISSISSIPPI; ADULTS; HYPERTENSION; CARDIOVASCULAR DISEASES; LEAD POISONING; METAL POISONING; BIOPSIES; CADMIUM; COPPER; LEAD; ZINC; METALS; BIOACCUMULATION; BIOLOGICAL MONITORING Medeiros, D.M.; Pellum, L.K. 1984 Bulletin of Environmental Contamination and Toxicology 32:525-532				

Lead
7439-92-1
Pb
AtW 207.2, MP 327.4 C, BP 1740 C, VP 1.77 mm Hg at 1000 C, 1 mm Hg at 970 C, 10 mm Hg at 1160 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9425 Hair	a) 62 b) 70 c) 28 d) 28	a) 2.30-51.0 mg/kg b) 1.90-53.0 mg/kg c) 2.2-66.4 mg/kg d) 2.7-38.0 mg/kg	a) 7.55 mg/kg b) 5.70 mg/kg c) 6.25 mg/kg d) 6.40 mg/kg	a) Caucasian boys b) Caucasian girls c) Hindustani children d) Creol, Chinese, and Javanese subjects, migrated from Surinam 5 g scalp hair from occipital region. 8 yr old school children living in Amsterdam suburb NA; AAS

HAIR; ENVIRONMENTAL EXPOSURE; NETHERLANDS; CHILDREN; SEX; BIOACCUMULATION; BIOLOGICAL MONITORING; DIETS; COPPER; ZINC; LEAD; IRON; CADMIUM; SELENIUM; COBALT; SILVER; GOLD
Herber, R.P.M.; Wibowo, A.A.E.; Das, H.A.; Egger, R.J.; van Deyck, W.; Zielhuis, R.L. 1983 International Archives of Occupational and Environmental Health 53:127-137

Tissue	Cases Exposure Route	Range	Mean	General Information
9426 Hair	a) 4 b) 6 c) 5 d) 11 e) 10	a) 1500-2100 ppb b) 1000-5000 ppb c) 1500-4200 ppb d) 1000-1700 ppb e) 1000-5200 ppb	a) 1900 ppb b) 1850 ppb c) 2575 ppb d) 6136 ppb e) 2620 ppb	a) 1-15 yr olds, rural b) 15-25 yr olds, rural c) 25 yr olds, rural d) 15-25 yr olds, different areas of country e) All age groups, different areas of country 15-25 yr olds had highest levels of trace elements. Residents of Sri Lanka AAS

HAIR; ENVIRONMENTAL EXPOSURE; SRI LANKA; CHILDREN; ADULTS; LEAD POISONING; METAL POISONING; CALCIUM; MAGNESIUM; IRON; MANGANESE; COPPER; ZINC; LEAD; AUTOMOTIVE; AIR POLLUTION; BIOACCUMULATION; HEALTH HAZARDS; LAND POLLUTION; POPULATION EXPOSURE; RURAL AREAS; URBAN AREAS; AGE
Dissanayake, C.B.; Senaratne, A.; Weerasooriya, S.V.R. 1984 Journal of Environmental Studies 23:41-48

Tissue	Cases Exposure Route	Range	Mean	General Information
9427 Hair	a) 68 b) 51 c) 4 d) 18	a) Not given b) Not given c) Not given d) Not given	a) 61+/-4.1 ug/g b) 102+/-2.3 ug/g c) 11+/-8.9 ug/g d) 14+/-5.4 ug/g Geometric means	a) Total, unwashed hair samples b) Hair pieces c) Needle-pads d) Others (undefined) In unwashed samples, significant difference between sample types ($p<0.001$) and between dates of cutting ($p<0.001$). After washing (non-ionic SAA), levels significantly higher in 1911-1968 samples than in 1981-1983. Japanese women. 1981-1983 samples from 22 workers at National Institute of Environmental Studies Atomic emission spectrometry; AAS

HAIR; ENVIRONMENTAL EXPOSURE; JAPAN; COMPARATIVE EVALUATIONS; CALCIUM; COPPER; IRON; LEAD; MAGNESIUM; MANGANESE; MERCURY; MERCURY ORGANIC COMPOUNDS; METALS; MINERALS; PHOSPHORUS; POTASSIUM; SODIUM; STRONTIUM; TRACE ELEMENTS; ZINC; OCCUPATIONAL EXPOSURE
Suzuki, T.; Hongo, T.; Morita, M.; Yamamoto, R. 1984 Science of the Total Environment 39:81-91

Lead
7439-92-1
Pb
AtW 207.2, MP 327.4 C, BP 1740 C, VP 1.77 mm Hg at 1000 C, 1 mm Hg at 970 C, 10 mm Hg at 1160 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9428 Heart	1 Inhalation	Not applicable	0.73 ppm	Autopsy Healthy 36 yr old man died about 5 days after smelting 182 kg lead for 24 hr in enclosed environment AAS
9429 Intestine	1 Inhalation	Not applicable	6.85 ppm	Autopsy Healthy 36 yr old man died about 5 days after smelting 182 kg lead for 24 hr in enclosed environment AAS

BLOOD; BRAIN; HEART; INTESTINES; KIDNEYS; LIVER; LUNGS; MUSCLES; SKIN; SPLEEN; STOMACH; URINE; ENVIRONMENTAL EXPOSURE; UNITED KINGDOM; ADULTS; AUTOPSIES; METAL POISONING; CADMIUM; LEAD; INHALATION

Taylor, A.; Jackson, M.A.; Patil, D.; Burston, J.; Lee, H.A. 1984 British Medical Journal 288:1270-1271

Tissue	Cases Exposure Route	Range	Mean	General Information
9430 Intestine				Review. Major system and organ response to intoxication, particularly at low tissue levels, discussed. Clinical aspects emphasized.

BLOOD; ERYTHROCYTES; GASTROINTESTINAL SYSTEM; LIVER; MUSCULOSKELETAL SYSTEM; KIDNEYS; SEMEN; TESTES; THYROID GLANDS; REVIEW; ENVIRONMENTAL EXPOSURE; LEAD POISONING; LEAD; HEALTH HAZARDS

Cullen, M.R.; Robins, J.M.; Eskenazi, B. 1983 Medicine 62(4):221-247

Tissue	Cases Exposure Route	Range	Mean	General Information
9431 Kidney	2	a) Not applicable b) Not applicable	a) 1.00 ppm b) 0.07 ppm	Autopsies a) Healthy 36 yr old man died about 5 days after smelting 182 kg lead for 24 hr in enclosed environment b) Control, 60 yr old man without renal disease AAS

BLOOD; BRAIN; HEART; INTESTINES; KIDNEYS; LIVER; LUNGS; MUSCLES; SKIN; SPLEEN; STOMACH; URINE; ENVIRONMENTAL EXPOSURE; UNITED KINGDOM; ADULTS; AUTOPSIES; METAL POISONING; CADMIUM; LEAD; INHALATION

Taylor, A.; Jackson, M.A.; Patil, D.; Burston, J.; Lee, H.A. 1984 British Medical Journal 288:1270-1271

Tissue	Cases Exposure Route	Range	Mean	General Information
9432 Kidney				Review. Major system and organ response to intoxication, particularly at low tissue levels, discussed. Clinical aspects emphasized.

BLOOD; ERYTHROCYTES; GASTROINTESTINAL SYSTEM; LIVER; MUSCULOSKELETAL SYSTEM; KIDNEYS; SEMEN; TESTES; THYROID GLANDS; REVIEW; ENVIRONMENTAL EXPOSURE; LEAD POISONING; LEAD; HEALTH HAZARDS

Cullen, M.R.; Robins, J.M.; Eskenazi, B. 1983 Medicine 62(4):221-247

Lead
7439-92-1
Pb
AtW 207.2, MP 327.4 C, BP 1740 C, VP 1.77 mm Hg at 1000 C, 1 mm Hg at 970 C, 10 mm Hg at 1160 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9433 Liver	2	a) Not applicable b) Not applicable	a) 1.66 ppm b) 1.26 ppm	Autopsies a) Healthy 36 yr old man died about 5 days after smelting 182 kg lead for 24 hr in enclosed environment b) Control, 60 yr old man without renal disease AAS

BLOOD; BRAIN; HEART; INTESTINES; KIDNEYS; LIVER; LUNGS; MUSCLES; SKIN; SPLEEN; STOMACH; URINE; ENVIRONMENTAL EXPOSURE; UNITED KINGDOM; ADULTS; AUTOPSIES; METAL POISONING; CADMIUM; LEAD INHALATION

Taylor, A.; Jackson, M.A.; Patil, D.; Burston, J.; Lee, H.A. 1984 British Medical Journal 288:1270-1271

Tissue	Cases Exposure Route	Range	Mean	General Information
9434 Liver		a) 0.17-1.66 ug/g b) 0.12-1.10 ug/g	a) 0.67 ug/g b) 0.47 ug/g	a) 1 sample from 13 of 36 livers, IDMS b) 1 sample from 24 of 36 livers, voltammetry Normal tissues from autopsies. Baltimore, MD; Minneapolis, MN, Seattle, WA IDMS voltammetry

LIVER; ENVIRONMENTAL EXPOSURE; AUTOPSIES; COMPARATIVE EVALUATIONS; MEASUREMENT METHODS; ALUMINUM; CADMIUM; COPPER; LEAD; MANGANESE; SELENIUM; ZINC

Zeisler, R.; Harrison, S.H.; Wise, S.A. 1984 Biological Trace Element Research 6:31-40

Tissue	Cases Exposure Route	Range	Mean	General Information
9435 Liver	96	a) 0.5-2.8 mg/kg b) 0.05-3.5 mg/kg	a) 1.15+/-0.47 mg/kg b) 1.50+/-0.64 mg/kg	a) Females b) Males Autopsies. Positive correlation with age. Levels generally lower than those in other countries. No major regional variations. New Zealanders. Death by physical injuries AAS

LIVER ; COMPARATIVE EVALUATIONS; ARSENIC; CADMIUM; CHROMIUM; COBALT; COPPER; NEW ZEALAND; AUTOPSIES; LEAD; MANGANESE; MERCURY; NICKEL; SELENIUM; SILVER; ZINC

Pickston, L.; Lewin, J.F.; Drysdale, J.M.; Smith, J.M.; Bruce, J. 1983 Journal of Analytical Toxicology 7:2-6

Tissue	Cases Exposure Route	Range	Mean	General Information
9436 Liver				Review. Major system and organ response to intoxication, particularly at low tissue levels, discussed. Clinical aspects emphasized.

BLOOD; ERYTHROCYTES; GASTROINTESTINAL SYSTEM; LIVER; MUSCULOSKELETAL SYSTEM; KIDNEYS; SEMEN; TESTES; THYROID GLANDS; REVIEW; ENVIRONMENTAL EXPOSURE; LEAD POISONING; LEAD; HEALTH HAZARDS

Cullen, M.R.; Robins, J.M.; Eskenazi, B. 1983 Medicine 62(4):221-247

Lead
7439-92-1
Pb
AtW 207.2, MP 327.4 C, BP 1740 C, VP 1.77 mm Hg at 1000 C, 1 mm Hg at 970 C, 10 mm Hg at 1160 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9457 Lung	2	a) Not applicable b) Not applicable	a) 0.79 ppm b) 0.87 ppm	Autopsies a) Healthy 36 yr old man died about 5 days after smelting 162 kg lead for 24 hr in enclosed environment b) Control, 60 yr old man without renal disease AAS
BLOOD; BRAIN; HEART; INTESTINES; KIDNEYS; LIVER; LUNGS; MUSCLES; SKIN; SPLEEN; STOMACH; URINE; ENVIRONMENTAL EXPOSURE; UNITED KINGDOM; ADULTS; AUTOPSIES; METAL POISONING; CADMIUM; LEAD; INHALATION Taylor, A.; Jackson, M.A.; Patil, D.; Burston, J.; Lee, H.A. 1984 British Medical Journal 288:1270-1271				

Tissue	Cases Exposure Route	Range	Mean	General Information
9486 Milk	89	0.9-10 ng/ml	2.8+/-1.6 ng/ml	62 samples taken 1-22 mo postpartum. No significant relationship with time postpartum, location, levels in hair and blood, environment Lactating 22-47 yr olds, rural and urban areas, Tucson, AZ AAS
LEAD; BLOOD; MILK; HAIR; LACTATION; RURAL AREAS; URBAN AREAS; ENVIRONMENTAL EXPOSURE Rockway, S.W.; Weber, C.W.; Lei, K.Y.; Kemberling, S.R. 1984 International Archives of Occupational and Environmental Health 53:181-187				

Tissue	Cases Exposure Route	Range	Mean	General Information
9439 Milk				Review. Levels after occupational exposures to trace metals, solvents, and halogenated hydrocarbons discussed in terms of milk partition factors, potential infant exposures, possible health effects.
MILK; ENVIRONMENTAL EXPOSURE; ADULTS; REVIEW; MERCURY; LEAD; DDT; DIELDRIN; POLYCHLORINATED BIPHENYLS; POLYBROMINATED BIPHENYLS; CHROMIUM; CADMIUM; HEPTACHLOR EPOXIDE; OXYCHLORDANE; BIOACCUMULATION; LACTATION; HEALTH HAZARDS Wolff, M.S. 1983 American Journal of Industrial Medicine 4:259-281				

Lead
7439-92-1
Pb
AtW 207.2, MP 327.4 C, BP 1740 C, VP 1.77 mm Hg at 1000 C, 1 mm Hg at 970 C, 10 mm Hg at 1160 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9440 Milk		a) Not given b) Not given c) 12-46 ng/ml d) 8-5 ng/ml	a) 17 ng/ml b) 15 ng/ml c) Not given d) Not given	a) Philippines, Spain, Sweden b) Hungary c) US d) Nigeria, Zaire, Guatemala Levels from database containing data on "normal" levels of 15 elements in 7 tissues/fluids. Data selected by 60 investigators in over 40 countries. Diet, environment both important in distribution of elements.
ZINC; COPPER; MANGANESE; SELENIUM; LEAD; CADMIUM; BLOOD; BLOOD SERUM; HAIR; MILK; BANGLADESH; INDIA; TURKEY; FINLAND; ITALY; NEW ZEALAND; GUATEMALA; CHILE; SWEDEN; HUNGARY; YUGOSLAVIA; POLAND; KENYA; EGYPT; SOUTH AFRICA; UNITED STATES; AUSTRALIA; GREECE; PAKISTAN; NIGERIA; PHILIPPINES; ZAIRE; THAILAND; CHINA; WYOMING; OHIO; CALIFORNIA; JAPAN; MEXICO; CANADA; ISRAEL; PERU; SPAIN; COMPARATIVE EVALUATIONS; BIOLOGICAL MONITORING; IRAN; DIETS; ENVIRONMENTAL EXPOSURE Iyengar, G.V. 1984 Science of the Total Environment 38:125-131				

Tissue	Cases Exposure Route	Range	Mean	General Information
9441 Milk	a) 89 b) 91	a) Not given b) Not given	a) 0.0253+/-0.0115 ug/ml b) 0.0211+/-0.0066 ug/ml	a) Urban, Kuala Lumpur b) Rural, Kuala Langat district Collected 5/83. No specific pattern at different lactation stages. Lactating mothers, malaysia AAS
ENVIRONMENTAL EXPOSURE; MALAYSIA; ADULTS; MILK; COMPARATIVE EVALUATIONS; LEAD; BIOACCUMULATION; LACTATION; RURAL AREAS; URBAN AREAS Hunt, L.H.; Zakariya, D.; Eng, K.H. 1988 Archives of Environmental Health 38(4):205-208				

Tissue	Cases Exposure Route	Range	Mean	General Information
9442 Milk				Review. Occupational exposures are discussed in terms of milk partition factors, potential infant exposures, possible infant health effects.
LEAD; MERCURY; PESTICIDES; POLYCHLORINATED BIPHENYLS; OCCUPATIONAL HAZARDS; MILK; COMPARATIVE EVALUATIONS; REVIEW; CADMIUM; CHROMIUM; DDT; DIELDRIN; INFANTS Wolff, M.S. 1985 American Journal of Industrial Medicine 4:269-281				

Lead
7439-92-1
Pb
AtW 207.2, MP 327.4 C, BP 1740 C, VP 1.77 mm Hg at 1000 C, 1 mm Hg at 970 C, 10 mm Hg at 1160 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9448 Muscle	2	a) Not applicable b) Not applicable	a) 0.67 ppm b) 0.80 ppm	Autopsies a) Healthy 36 yr old man died about 5 days after smelting 182 kg lead for 24 hr in enclosed environment b) Control, 60 yr old man without renal disease AAS

BLOOD; BRAIN; HEART; INTESTINES; KIDNEYS; LIVER; LUNGS; MUSCLES; SKIN; SPLEEN; STOMACH; URINE; ENVIRONMENTAL EXPOSURE; UNITED KINGDOM; ADULTS; AUTOPSIES; METAL POISONING; CADMIUM; LEAD; INHALATION
Taylor, A.; Jackson, M.A.; Patil, D.; Burston, J.; Lee, H.A. 1984 British Medical Journal 288:1270-1271

Tissue	Cases Exposure Route	Range	Mean	General Information
9444 Muscle				Review. Major system and organ response to intoxication, particularly at low tissue levels, discussed. Clinical aspects emphasized.

BLOOD; ERYTHROCYTES; GASTROINTESTINAL SYSTEM; LIVER; MUSCULOSKELETAL SYSTEM; KIDNEYS; SEMEN; TESTES; THYROID GLANDS; REVIEW; ENVIRONMENTAL EXPOSURE; LEAD POISONING; LEAD; HEALTH HAZARDS
Cullen, M.R.; Robins, J.M.; Rohonsi, B. 1983 Medicine 62(4):221-247

Tissue	Cases Exposure Route	Range	Mean	General Information
9446 Placenta	281	5-174 ppb	48+/-24 ppb	110 cases Nagoya, Japan, 1974-1978. Normal deliveries. AAS

ZINC; MERCURY; METHYLMERCURY; LEAD; CADMIUM; MANGANESE; COPPER; IRON; JAPAN; BLOOD; PLACENTA; UMBILICAL CORD; METALS; ENVIRONMENTAL EXPOSURE
Tsuchiya, H.; Mitani, K.; Kodama, K.; Nakato, T. 1984 Archives of Environmental Health 39(1):11-17

Tissue	Cases Exposure Route	Range	Mean	General Information
9446 Placenta				Review. Discussion of relationship to specificity of fetal effects, follow-up, possible mechanisms of toxicity. Specimens from U.S., W. Germany, Belgium, United Kingdom

PLACENTA; ALABAMA; BELGIUM; CALIFORNIA; GEORGIA; GERMANY; IOWA; JAPAN; MISSOURI; NEW JERSEY; NEW YORK; NORTH CAROLINA; OHIO; TENNESSEE; TEXAS; UNITED KINGDOM; UTAH; CADMIUM; COPPER; LEAD; MERCURY; MERCURY INORGANIC COMPOUNDS; MERCURY ORGANIC COMPOUNDS; ZINC; PREGNANCY; BEHAVIOR DISORDERS
Miller, R.K. 1984 American Journal of Industrial Medicine 4:205-244

Lead
7439-92-1
Pb
AtW 207.2, MP 327.4 C, BP 1740 C, VP 1.77 mm Hg at 1000 C, 1 mm Hg at 970 C, 10 mm Hg at 1160 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9447 Saliva	a) 8 b) 2	a) 70-248 ug/l b) 175-63 ug/l	a) Not given b) Not given	a) On d 1 after removal of workers from plant b) On d 22 and 26 Levels decrease faster than do blood levels. Temporary return to plant by 2 workers caused more marked increases in saliva than in blood levels. Workers in storage battery lead recovery plant AAS
BLOOD; SALIVA; OCCUPATIONAL EXPOSURE; LEAD; INDUSTRIAL ATMOSPHERES; INDUSTRIES; MINERAL METABOLISM; OCCUPATIONAL HAZARDS Brodeur, J.; Lecasse, Y.; Talbot, D. 1988 Toxicology Letters 19:195-199				

Tissue	Cases Exposure Route	Range	Mean	General Information
9448 Semen				Review. Major system and organ response to intoxication, particularly at low tissue levels, discussed. Clinical aspects emphasized.
BLOOD; ERYTHROCYTES; GASTROINTESTINAL SYSTEM; LIVER; MUSCULOSKELETAL SYSTEM; KIDNEYS; SEMEN; TESTES; THYROID GLANDS; REVIEW; ENVIRONMENTAL EXPOSURE; LEAD POISONING; LEAD; HEALTH HAZARDS Cullen, M.R.; Robins, J.M.; Eskenazi, B. 1988 Medicine 62(4):221-247				

Tissue	Cases Exposure Route	Range	Mean	General Information
9449 Skin	2	a) Not applicable b) Not applicable	a) 0.80 ppm b) 0.46 ppm	a) Healthy 36 yr old man died about 5 days after smelting 182 kg lead for 24 hr in enclosed environment b) Control, 40 yr old man without renal disease Autopsies AAS
9450 Stomach	1 Inhalation	Not applicable	0.94 ppm	Autopsy Healthy 36 yr old man died about 5 days after smelting 182 kg lead for 24 hr in enclosed environment AAS
BLOOD; BRAIN; HEART; INTESTINES; KIDNEYS; LIVER; LUNGS; MUSCLES; SKIN; SPLEEN; STOMACH; URINE; ENVIRONMENTAL EXPOSURE; UNITED KINGDOM; ADULTS; AUTOPSIES; METAL POISONING; CADMIUM; LEAD; INHALATION Taylor, A.; Jackson, M.A.; Patil, D.; Burston, J.; Lee, H.A. 1984 British Medical Journal 288:1270-1271				

Lead
7439-92-1
Pb
AtW 207.2, MP 327.4 C, BP 1740 C, VP 1.77 mm Hg at 1000 C, 1 mm Hg at 970 C, 10 mm Hg at 1160 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9451 Teeth	198	a) 0->10 ug/g b) 0->150 ug/g	a) 5.00 ug/g b) 59.8 ug/g Medians	a) Primary dentine b) Circumpulpal dentine 136 teeth. Circumpulpal dentine better reflector of chronic exposure and neuropsychological impairment. 10.57-14.67 yr old (mean 11.79+/-0.83) inner city black children, low socioeconomic status, Philadelphia, Pennsylvania Verbal abilities and performance abilities negatively affected AAS
TEETH; ENVIRONMENTAL EXPOSURE; PENNSYLVANIA; CHILDREN; RACIAL STUDIES; NEUROLOGIC MANIFESTATIONS; LEAD; BIOACCUMULATION; URBAN AREAS Shapiro, I.M.; Marecek, J. 1984 Biological Trace Element Research 6:69-78				

Tissue	Cases Exposure Route	Range	Mean	General Information
9452 Teeth	292	0-29 ug/g	3.4+/-4.1 ug/g	Deciduous teeth. 213 of total in 0-4 ug/g range. Data also presented by locality and age of dwelling. 4 and 9 yr olds, Queensland, Australia Plasma-atomic emission
ENVIRONMENTAL EXPOSURE; LEAD; TEETH; CHILDREN; AUSTRALIA Clegg, D.E.; Eddington, I.W.; McKinnon, P.J.; Shemach, M.D. 1984 Medical Journal of Australia 141:590-593				

Tissue	Cases Exposure Route	Range	Mean	General Information
9453 Teeth	136	a) 0->10 ug/g b) 0->150 ug/g	a) 5.0 ug/g b) 59.8 ug/g Medians	a) Primary dentine b) Secondary dentine From deciduous teeth. Skewed distributions. Results of neuropsychological testing also reported. Inner-city blacks, <15 yr old, no medical history of neurological disease, head trauma, mental retardation or lead poisoning, Philadephia. Modest neuropsychological impairment AAS
TEETH; ENVIRONMENTAL EXPOSURE; PENNSYLVANIA; CHILDREN; NEUROLOGIC MANIFESTATIONS; LEAD; BIOLOGICAL MONITORING; HEALTH HAZARDS; URBAN AREAS Marecek, J.; Shapiro, I.M.; Burke, A.; Katz, S.H.; Hediger, M.L. 1983 Archives of Environmental Health 38(6):355-359				

Lead
7439-92-1
Pb
AtW 207.2, MP 327.4 C, BP 1740 C, VP 1.77 mm Hg at 1000 C, 1 mm Hg at 970 C, 10 mm Hg at 1160 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9454 Teeth	a) 28 b) 28 c) 27 d) 23 e) 25 f) 26 g) 25 h) 26	a) 0.4-14 ppm b) 2.2-49 ppm c) 1.8-7.1 ppm d) 1.1-15 ppm) 0.2-8.9 ppm f) 0.4-138 ppm g) 0.6-12 ppm h) 1.4-22 ppm	a) 2.5 ppm b) 9.1 ppm c) 2.7 ppm d) 4.4 ppm e) 2.0 ppm f) 4.2 ppm g) 2.9 ppm h) 4.5 ppm Medians	a) Dentine in 6 yr olds, Helsinki b) Enamel c) Dentine in 6 yr olds, Kuopio d) Enamel e) Dentine in 9 yr olds, Helsinki f) Enamel g) Dentine in 9 yr olds Kuopio h) Enamel p<.05, c) and d). P<.01, b) and d), e) and f), g) and h). P<.001, a) & b). Deciduous teeth, levels considered moderate to low. Children from Helsinki (presumed to be high Pb exposure area) and rural Kuopio (low or moderate exposure), Finland PIXE
ENVIRONMENTAL EXPOSURE; LEAD; TEETH; CHILDREN; FINLAND Haavikko, K.; Anttila, A.; Helle, A.; Vuori, E. 1984 Archives of Environmental Health 39(2):78-84				

Tissue	Cases Exposure Route	Range	Mean	General Information
9455 Teeth	115	1.0-38.5 ppm	6.2 ppm Geometric mean	Shed incisor teeth, measure of longtime exposure. Mean age 9.4 yr, range 7.1-12.1 yr. Residents of Pb-smelter area, Stalberg, FRG. 1979 AAS
TEETH; BLOOD; ENVIRONMENTAL EXPOSURE; GERMANY; CHILDREN; EXPERIMENTAL PSYCHOLOGY; LEAD; AIR POLLUTION; INDUSTRIAL AREAS; INDUSTRIAL POLLUTION; LAND POLLUTION; SMELTERS Winneke, G.; Kramer, U.; Brockhaus, A.; Ewers, U.; Kujanek, G.; Lechner, H.; Janke, W. 1983 International Archives of Occupational and Environmental Health 51:231-252				

Tissue	Cases Exposure Route	Range	Mean	General Information
9456 Testis				Review. Major system and organ response to intoxication, particularly at low tissue levels, discussed. Clinical aspects emphasized.
9457 Thyroid gland				Review. Major system and organ response to intoxication, particularly at low tissue levels, discussed. Clinical aspects emphasized.
BLOOD; ERYTHROCYTES; GASTROINTESTINAL SYSTEM; LIVER; MUSCULOSKELETAL SYSTEM; KIDNEYS; SEMEN; TESTES; THYROID GLANDS; REVIEW; ENVIRONMENTAL EXPOSURE; LEAD POISONING; LEAD; HEALTH HAZARDS Cullen, M.R.; Robins, J.M.; Eskenazi, B. 1983 Medicine 62(4):221-247				

Lead
7439-92-1
Pb
AtW 207.2, MP 327.4 C, BP 1740 C, VP 1.77 mm Hg at 1000 C, 1 mm Hg at 970 C, 10 mm Hg at 1160 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9458 Umbilical cord	281	5-200 ppb	57+/-53 ppb	108 cases Nagoya, Japan, 1974-1978. Normal deliveries. AAS
ZINC; MERCURY; METHYLMERCURY; LEAD; CADMIUM; MANGANESE; COPPER; IRON; JAPAN; BLOOD; PLACENTA; UMBILICAL CORD; METALS; ENVIRONMENTAL EXPOSURE Tsuchiya, H.; Mitani, K.; Kodama, K.; Nakata, T. 1984 Archives of Environmental Health 39(1):11-17				

Tissue	Cases Exposure Route	Range	Mean	General Information
9459 Urine	1 Inhalation	Not applicable	8572 ug/d	Receiving chelation therapy, elevated level from sniffing gasoline 16.5 yr old native male, Ontario, Canada Encephalopathy
ERYTHROCYTES; BLOOD; URINE; DELIBERATE EXPOSURE; CANADA; ADOLESCENTS; NEUROLOGIC MANIFESTATIONS; HYDROCARBONS; FUMES; GASOLINE; INHALATION Tenenbein, M.; deGroot, W.; Rajani, K.R. 1984 Canadian Medical Association Journal 131:1077-1079				

Tissue	Cases Exposure Route	Range	Mean	General Information
9460 Urine	1	a) Not given b) Not given c) Not given d) 60-260 ug/24 hr	a) 1000 ug/24 hr b) 100 ug/24 hr c) 150 ug/24 hr d) Not given	a) During EDTA therapy b) After EDTA therapy c) 4 yr later, before EDTA d) 5 yr later, during EDTA therapy Patient with toxogenic disease which sensitised him to Pb. Abdominal symptoms, a) and b) while working with paints, no protective mask. 30 yr old painter, F.R.G. Acute abdominal-neurologic syndrome (abdominal pains, paresthesia) Ulcus duodeni, icterus, fatty liver disease, blue seam at gingiva, normochrome anemia, hypertonus. Red, white cell pools balanced, normoblasts, basophilic stipling. High ALA, coproporphyrin excretion AAS
BLOOD; URINE; OCCUPATIONAL EXPOSURE; GERMANY; ADULTS; LEAD POISONING; LEAD; OCCUPATIONAL HAZARDS; PAINTS; GENETIC EFFECTS Doss, M.; Laubenthal, F.; Stoeppler, M. 1984 International Archives of Occupational and Environmental Health 54:55-68				

Lead
7439-92-1
Pb
AtW 207.2, MP 327.4 C, BP 1740 C, VP 1.77 mm Hg at 1000 C, 1 mm Hg at 970 C, 10 mm Hg at 1160 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9451 Urine	1 Ingestion	a) Not applicable b) Not applicable c) Not applicable d) Not applicable	a) 0.06 umol/L b) 3.96 umol/L c) 0.74 umol/L d) 1.10 umol/L	a) Before Ca-EDTA chelation treatment b) 1-2 d after starting treatment c) 6 wk later d) 12 mo after discharge Normal, <0.2 umol/L. Ca-EDTA, 50 mg/kg body wt/d for 5 d, IM. 8 of these regimens ended 6 wk after admission. Level before treatment points out need to analyze blood in addition to urine. 2 yr old AAS

BLOOD; URINE; ENVIRONMENTAL EXPOSURE; AUSTRALIA; CHILDREN; LEAD POISONING; METAL POISONING; ACCIDENTAL POISONING; BIOACCUMULATION
Kazacos, M.; Moore, P. 1984 Medical Journal of Australia 140:429-430

Tissue	Cases Exposure Route	Range	Mean	General Information
9462 Urine	1 Inhalation	Not applicable	<100 nmol (<2.1 ug/100 ml)	Subject sampled 48 hr after smelting 182 kg Pb for 24 hr in enclosed environment, died 72 hr later. Normal levels are <10 nmol (<0.11 ug/100 ml). Healthy 36 yr old AAS

BLOOD; BRAIN; HEART; INTESTINES; KIDNEYS; LIVER; LUNGS; MUSCLES; SKIN; SPLEEN; STOMACH; URINE; ENVIRONMENTAL EXPOSURE; UNITED KINGDOM; ADULTS; AUTOPSIES; METAL POISONING; CADMIUM; LEAD; INHALATION
Taylor, A.; Jackson, M.A.; Patil, D.; Burston, J.; Lee, H.A. 1984 British Medical Journal 288:1270-1271

Tissue	Cases Exposure Route	Range	Mean	General Information
9463 Urine	25 Ingestion	1.7-9.8 ug/d	6.2 ug/d	Diets and urine collected over 5-day period. Metabolic balance studies showed significant correlation between daily dietary Pb and intakes of N, Fe, Ca, Zn, and energy but not Cu or Mn. Negative Pb balance in 14 subjects. No correlation between intake and retention. Old age has marked effect on retention. Healthy, elderly, nonsmokers, 11 males, 12 females, age 69-85, England AAS

BLOOD SERUM; URINE; ENGLAND; CADMIUM; IRON; LEAD; DIETS; AGE; ENVIRONMENTAL EXPOSURE
Bunker, V.W.; Lawson, M.S.; Delves, H.T.; Clayton, B.E. 1984 American Journal of Clinical Nutrition 39:803-806

Lead
7439-92-1
Pb
AtW 207.2, MP 327.4 C, BP 1740 C, VP 1.77 mm Hg at 1000 C, 1 mm Hg at 970 C, 10 mm Hg at 1160 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9464 Urine	a) 106 b) 810 c) 321 d) 89 e) 70 f) 947 g) 766	a) 0.6-63.6 ug/l b) 1.3-71.4 ug/l c) 0.7-37.0 ug/l d) 1.1-70.3 ug/l e) 1.8-56.7 ug/l f) 0.9-81.3 ug/l g) 0.9-59.9 ug/l	a) 10.8 ug/l b) 9.3 ug/l c) 8.9 ug/l d) 15.8 ug/l e) 13.6 ug/l f) 11.7 ug/l g) 10.6 ug/l	a) T city, pottery worker mothers b) T city non-pottery worker mothers c) Control city mothers, few industrial sources of Pb d) T city children, one or both parents pottery workers at home e) T city children, one or both parents pottery workers in factory f) T city children, neither parents pottery workers g) Control city children Small significant difference between a) and c). Frequency of abnormal Pb six times higher in d) than g) Mothers and 3 yr old children, Japan AAS
URINE; ENVIRONMENTAL EXPOSURE; OCCUPATIONAL EXPOSURE; JAPAN; ADULTS; CHILDREN; LEAD; INDUSTRIAL POLLUTION; METALS; COMPARATIVE EVALUATIONS Katagiri, Y.; Toriumi, H.; Kawai, M. 1988 International Archives of Occupational and Environmental Health 52:223-229				

Tissue	Cases Exposure Route	Range	Mean	General Information
9465 Urine	1 Inhalation	42-81 ug/l	Not given	11 to 200 days post-exposure to Pb-contaminated cigarettes, peak at 60 days. Urinary coprophyrin also estimated. 31 yr old welder working in battery factory
BLOOD; URINE; OCCUPATIONAL EXPOSURE; UNITED KINGDOM; ADULTS; INDUSTRIAL HYGIENE; LEAD Williams, M.K. 1984 Journal of Occupational Medicine 26(7):532-538				

Tissue	Cases Exposure Route	Range	Mean	General Information
9466 Urine	2 Injection	a) Not given b) Not given	a) 7.6% b) 1%	a) During first 6 hr after iv administration b) Daily for following 16 d 20 uCi as Pb-203 chloride. Daily whole-body scans indicate half life of 72.7 d Healthy 24 yr olds, normal renal function Echo scanner
BLOOD PLASMA; ERYTHROCYTES; URINE; DELIBERATE EXPOSURE; LEAD; UNITED KINGDOM Campbell, B.C.; Meredith, P.A.; Moore, M.R.; Watson, W.S. 1984 Toxicology Letters 21:281-285				

Tissue	Cases Exposure Route	Range	Mean	General Information
9467 Urine	Ingestion	Not given	304 ug/l	At admission. After EDTA therapy for 30 and 50 d, levels were 280 and 58 ug/l 40 yr old man AAS
DELIBERATE EXPOSURE; LEAD; ALCOHOLIC BEVERAGES; CASE HISTORIES; URINE; BLOOD Perrelli, G.; Capellaro, E.; Pitas, E.; Maina, G.; Vergnano, P. 1984 American Journal of Industrial Medicine 5:377-381				

Lead
7439-92-1
Pb
AtW 207.2, MP 327.4 C, BP 1740 C, VP 1.77 mm Hg at 1000 C, 1 mm Hg at 970 C, 10 mm Hg at 1160 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9466 Urine	a) 17 b) 11 c) 5 d) 11 e) 8 f) 10	a) 5.7-301.4 ug/l b) 6.1-81.4 ug/l c) 7.1-19.8 ug/l d) 5.1-82.6 ug/l e) 9.0-16.1 ug/l f) 5.1-34.8 ug/l	a) 64.6 ug/l b) 13.8 ug/l c) 12.6 ug/l d) 13.5 ug/l e) 12.1 ug/l f) 16.8 ug/l	a) Adults doing cutlery-tempering at home, 8 households b) Other family members, >14 yr old c) Other family members, <12 yr old d) Adults doing type-printing at home, 7 households e) Other family members, >14 yr old f) Other family members, <12 yr old Ingestion of dust probable exposure route for children. Families in which Pb-work is done at home, Japan Flameless atomization
BLOOD; URINE; ENVIRONMENTAL EXPOSURE; OCCUPATIONAL EXPOSURE; JAPAN; ADULTS; CHILDREN; LEAD; DUST; HEALTH HAZARDS; INHALATION; OCCUPATIONAL HAZARDS Kawai, M.; Toriumi, H.; Katagiri, Y.; Maruyama, Y. 1988 International Archives of Occupational and Environmental Health 58:37-46				

Tissue	Cases Exposure Route	Range	Mean	General Information
9469 Urine	10 Injection	0-30 ug/hr	Not applicable	0-24 hr, peak (210 ug/hr) at 2 hr after 1 hr IV infusion of 20 mg EDTA/kg in 5% glucose. Range of means. Gun metal founders employed at factory 7-15 yr. Mean age 51 yr. AAS
URINE; BLOOD PLASMA; OCCUPATIONAL EXPOSURE; JAPAN; ADULTS; METAL POISONING; LEAD POISONING; COPPER; LEAD; ZINC; METALS; BIOACCUMULATION; INDUSTRIAL POLLUTION; BIOCONCENTRATION Aono, H.; Araki, S. 1984 International Archives of Occupational and Environmental Health 55:13-18				

Tissue	Cases Exposure Route	Range	Mean	General Information
9470 Urine	13	153-420 ug/24 hr	229+/-77 ug/24 hr	Workers admitted with symptoms of intoxication, altered biochemical parameters. 38 workers, 28-71 (mean 52) yr old, exposed 1-444 (mean 83) mo, time since exposure 36-324 (mean 145) mo. 25 controls, 26-72 (mean 50) yr old. Padova, Italy Elevated erythrocyte protoporphyrin. Changes in electro-myographic parameters Lowered max motor conduction velocity, slow-fiber conduction velocity - ulnar, peroneal nerves. Partial denervation in two AAS
LEAD; BLOOD; URINE; OCCUPATIONAL EXPOSURE; METALS; ITALY; NEUROLOGIC MANIFESTATIONS; OCCUPATIONAL HAZARDS Corsi, G.; Bartolucci, G.B.; Pardin, P.; Negrin, P.; Manzoni, S. 1984 American Journal of Industrial Medicine 6:281-290				

Lead
7439-92-1
Pb
AtW 207.2, MP 327.4 C, BP 1740 C, VP 1.77 mm Hg at 1000 C, 1 mm Hg at 970 C, 10 mm Hg at 1160 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9471 Urine				Review of 48 articles on industrial lead poisoning during the past 35 yr explored relationship of air lead levels with prevalence of plumbism. Studies involved 2504 subjects.
CHINA; LEAD; BLOOD; URINE; REVIEW; ENVIRONMENTAL EXPOSURE; LEAD POISONING; CHILDREN; ADULTS; INDUSTRIAL DISEASES; MEASUREMENT METHODS; OCCUPATIONAL EXPOSURE; OCCUPATIONAL DISEASES Wang, Y.L. 1984 Ecotoxicology and Environmental Safety 8:526-530				

Tissue	Cases Exposure Route	Range	Mean	General Information
9472 Urine	10 Inhalation	253-3,226 ug/24 hr	Not given	Admission levels 10-20 yr old (mean age 14.6 yr) Navajo Indians with Pb intoxication caused by gasoline sniffing, July 1974-June 1980, AZ
ARIZONA; ADOLESCENTS; RACIAL STUDIES; LEAD POISONING; METAL POISONING; BLOOD; URINE; LEAD; METALS; GASOLINE; DELIBERATE EXPOSURE Coulehan, J.L.; Hirsch, W.; Brillman, J.; Sanandria, J.; Welty, T.K.; Colaiaco, P.; Koros, A.; Lober, A. 1983 Pediatrics 71(1):113-117				

Tissue	Cases Exposure Route	Range	Mean	General Information
9473 Urine	a) 27 b) 21 c) 15 d) 7	a) Not given b) Not given c) Not given d) Not given	a) 860+/-101 ug b) 340+/-39 ug c) 447+/-65 ug d) 426+/-84 ug	a) Essential hypertension and renal disease b) Essential hypertension, no renal disease c) Hypertension due to renal disease d) Renal disease, no hypertension Levels 3 d after EDTA Pb mobilization test. a), b) significantly different ($p<0.001$. No current occupational exposure. Possible exposure from industrial sources or from consumption of "moonshine" in 24 patients in a), 16 in b), 15 in c). No symptoms of acute poisoning. 28-70 yr olds, Veterans Hospital, New Jersey. 40 with possible exposure, no acute poisoning ASV
NEW JERSEY; ADULTS ; HYPERTENSION; LEAD POISONING; BLOOD; URINE; DISEASES; KIDNEYS; LEAD; ENVIRONMENTAL EXPOSURE Batuman, V.; Landy, E.; Maesaka, J.K.; Wedeen, R.P. 1983 New England Journal of Medicine 309:17-21				

Tissue	Cases Exposure Route	Range	Mean	General Information
9474 Urine	9	</=4.1 ug/ml	Not given	Random samples Detection limit was 4.1 ng/ml. Volunteers, laboratory personnel AAS
URINE; CADMIUM; LEAD; ENVIRONMENTAL EXPOSURE; ADULTS; MEASUREMENT METHODS; BIOLOGICAL MONITORING Subramanian, K.S.; Meranger, J.-C.; MacKeen, J.E. 1983 Analytical Chemistry 55:1064-1067				

Lead
7439-92-1
Pb
AtW 207.2, MP 327.4 C, BP 1740 C, VP 1.77 mm Hg at 1000 C, 1 mm Hg at 970 C, 10 mm Hg at 1160 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9475 Urine	72 Inhalation	a) 17-119 ug b) 21-141 ug c) 36-136 ug d) 21-108 ug e) 32-129 ug f) 20-73 ug g) 28-99 ug h) 28-101 ug /g creatinine	a) 64+/-23 ug b) 75+/-31 ug c) 79+/-31 ug d) 60+/-23 ug e) 58+/-34 ug f) 46+/-18 ug g) 59+/-24 ug h) 51+/-24 ug /g creatinine	a) Controls, 0 wks, 27 cases b) Controls, 16 wks, 27 cases c) Vitamin C treatment, 0 wks, 25 cases d) Vitamin C treatment, 16 wks, 25 cases e) Controls, 0 wks, 10 cases f) Controls, 8 wks, 10 cases g) Zinc treatment, 0 wks, 10 cases h) Zn treatment, 8 wks, 10 cases Vitamin C dose was 1 g/d, 5 d/wk. Zinc as Zn glutamate dose was 60 mg/d, 5 d/wk. No significant difference between control and treatment groups. 21-64 yr old workers at primary Pb smelter, 0.5-42 years exposure AAS
BLOOD; URINE; OCCUPATIONAL EXPOSURE; ADULTS; LEAD POISONING; METAL POISONING; INDUSTRIAL MEDICINE; CADMIUM; LEAD; MERCURY; ZINC; BIOACCUMULATION; HEALTH HAZARDS; INDUSTRIAL ATMOSPHERES; INDUSTRIAL PLANTS; INHALATION; OCCUPATIONAL HAZARDS; VITAMINS; VITAMIN C Lauwerys, R.; Roels, H.; Buchet, J.-P.; Bernard, A.A.; Verhoeven, L.; Konings, J. 1983 Journal of Occupational Medicine 25(9): 668-678				

Tissue	Cases Exposure Route	Range	Mean	General Information
9476 Urine	7	a) 0-20 ug/hr b) 95-222 ug/hr c) 110-265 ug/hr d) 100-227 ug/hr e) 73-240 ug/hr f) 25-80 ug/hr g) 10-30 ug/hr h) 1-25 ug/hr	a) 10 ug/hr b) 143 ug/hr c) 220 ug/hr d) 170 ug/hr e) 135 ug/hr f) 55 ug/hr g) 20 ug/hr h) 8 ug/hr	a) 24 hr before-0 hr b) 0-1 hr c) 1-2 hr d) 2-4 hr e) 4-6 hr f) 6-12 hr g) 12-24 hr h) 24-48 hr 1 hr 20 mg/kg CaEDTA IV infusion started at time 0. Estimated from graph. Adults with blood Pb 46-67 ug/100 g, 46-59 yr, employed at gun metal foundry 6-14 yr AAS
BLOOD; BLOOD PLASMA; ERYTHROCYTES; URINE; OCCUPATIONAL EXPOSURE; ADULTS; LEAD; ZINC Araki, S.; Aono, H.; Fukahori, M.; Tabuki, K. 1984 Archives of Environmental Health 39(5):363-367				

Lead, isotope of mass 203
14667-25-3
Pb

Tissue	Cases Exposure Route	Range	Mean	General Information
9477 Blood	3 Injection	>10%-<10% % dose/kg	Not given	Measured 0-326 hr. Estimated from graph. Dosages 1.6-20.7 uCi IV. 0.2% of circulating blood content in plasma at 50-100 hr. 29-58 yr old male volunteers, ht 1.52-1.73 m, wt 59.0-70.5 kg Radiometry

(next page)

Lead, isotope of mass 203

14557-25-5
Pb

(continued)

Tissue	Cases Exposure Route	Range	Mean	General Information
9478 Body	a) 1 b) 2 Injection	a) 98-79% b) 97-82% % dose retained	a) Not given b) Not given	a) Measured 20-360 hr dosages 1.6-20.5 uCi IV b) 20-265 hr dosages 1.6-20.7 uCi IV Estimated from graph. 29-56 yr old male volunteers, ht 1.52-1.73 m, wt 59.0-70.5 kg Radiometry
9479 Bone	3 Injection	a) Not given b) Not given	a) 13% b) 25% % of dose	a) 20 hr skeletal uptake b) 20 d skeletal uptake Dosages ranged from 1.6-20.7 uCi IV. 29-58 yr old male volunteers, ht 1.52-1.73 m, wt 59.0-70.5 kg Radiometry
9480 Liver	3 Injection	Not given	15% of dose	Systemic burden 30-300 hr post injection. Dosages 1.6-20.7 uCi IV. 29-58 yr old male volunteers, ht 1.52-1.73 m, wt 59.0-70.5 kg Radiometry

LEAD; CALCIUM; RADIONUCLIDES; BONES; BLOOD; RADIOISOTOPES; BODY; LIVER; DELIBERATE EXPOSURE; UNITED KINGDOM

Heard, M.J.; Chamberlain, A.C. 1984 Health Physics 47(6):857-865

Lead, isotope of mass 210

14255-04-0
Pb
MW 210

Tissue	Cases Exposure Route	Range	Mean	General Information
9481 Bone	5	a) 2.9-5.7 nCi b) 2.4-5.7 nCi	a) 3.3 nCi b) 3.9 nCi	a) 2 uranium miners b) 3 uranium mill workers. Total skeletal content. Mill and mine workers with lengthy experience. GE Detectors

BONES; OCCUPATIONAL EXPOSURE; UTAH; COLORADO; ADULTS; OCCUPATIONAL DISEASES; LEAD; HEALTH HAZARDS; IRRADIATION; OCCUPATIONAL HAZARDS; RADIATION DOSES; RADIOISOTOPES

Palmer, H.E.; Heid, K.R.; Moore, R.H. 1984 Health Physics 47(4):632-6

Lead, isotope of mass 210
14255-04-0
Pb
MW 210

Tissue	Cases Exposure Route	Range	Mean	General Information
9482 Teeth	a) 48 b) 48	a) Not given b) Not given	a) 2.7+/-1.7 mBq/g b) 5.0+/-1.6 mBq/g Wet wt	a) "Normal" group, Abruzzo, Italy. Individual radiation dose 0.82 mGy/y b) "Exposed" group, Badgastein, Austria. Mean radon level spa water 1.5+/-10(E+6) Bq/cu m , delivery rate 5X10(E+5) cu m/d Significantly higher levels in smokers. Pb-210 significantly correlated with radon exposure. Residents of Austria and Italy, various ages Spectrometry
ITALY; AUSTRIA; RADIONUCLIDES; LEAD; INHALATION; ENVIRONMENTAL EXPOSURE; IRRADIATION; WATER POLLUTION; TEETH; CONSUMER EXPOSURE; AIR POLLUTION; POPULATION EXPOSURE; RADIATION DOSES; ATMOSPHERE; BIOLOGICAL MONITORING; BIOACCUMULATION Clemente, G.F.; Renzetti, A.; Santori, G. 1984 Health Physics 47(2):255-262				

Lutetium
7439-94-5
Lu
AtW 174.97, MP 1652 C (also reported as 1668 C), BP 3395 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9468 Lung	a) 1 b) 9 Inhalation	a) Not given b) Not given	a) 25 ppb b) 0.4 ppb	a) Exposed worker, biopsy b) Unexposed controls, autopsies 58 yr old photoengraver, exposed to smoke from carbon arc lamp during 46 yr. 30-68 yr old controls. Italy Worker: dyspnea, cough, cyanosis (extremities), crepitant rales, pulmonary fibrosis, hypertension, cardiac hypertrophy and overloading, death from acute cardiorespiratory insufficiency NA
9464 Lymph node	a) 1 b) 5 Inhalation	a) Not given b) Not given	a) 0.5 ppb b) 1.3 ppb	a) Exposed worker, biopsy b) Unexposed controls, autopsies 58 yr old photoengraver, exposed to smoke from carbon arc lamp during 46 yr. 30-68 yr old controls. Italy Worker: dyspnea, cough, cyanosis (extremities), crepitant rales, pulmonary fibrosis, hypertension, cardiac hypertrophy and overloading, death from acute cardiorespiratory insufficiency NA
NEODYMIUM; YTTERBIUM; TERBIUM; EUROPIUM; LUTETIUM; ITALY; ADULTS; AUTOPSIES; CASE HISTORIES; PNEUMOCONIOSIS; LUNGS; LYMPH NODES; BIOPSIES; CERIUM; LANTHANUM; METALS; SAMARIUM; THORIUM; DUST; FUMES; INHALATION; OCCUPATIONAL HAZARDS; PRINTING INDUSTRY; OCCUPATIONAL EXPOSURE Vocaturo, G.; Colombo, F.; Zanoni, M.; Rodi, F.; Sabbioni, E.; Pietra, R. 1968 Chest 58(5):760-765				

m-Xylene (8 CI); Benzene, 1,3-dimethyl- (9 CI)
108-38-3
C8-H10
MW 106.16, MP -47.4 C, VP 10 mm Hg at 28.3 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9488 Urine	4 Inhalation	Not given	a) 97.4+/-0.7% b) 2.6+/-0.7% c) 0.08+/-0.01% d) 96.1+/-0.7% e) 3.8+/-0.7% f) 0.06+/-0.03%	a) % collected as m-methylhippuric acid metabolite b) % collected as 2,4-dimethylphenol metabolite c) % collected as m-methylbenzyl alcohol metabolite d) % collected as m-methylhippuric acid metabolite e) % collected as 2,4-dimethylphenol metabolite f) % collected as 3-methylbenzyl alcohol metabolite a-c) exposure dose 150 ppm, 24 hr collection period, d-f) exposure dose 150 ppm + 150 ppm ethylbenzene, 24 hr collection period. No significant differences. Research workers, 33-40 yr old GC/MS
URINE; DELIBERATE EXPOSURE; ADULTS; FINLAND; XYLENE; BENZENES; BIOACCUMULATION; METABOLITES Engstrom, K.; Riihimaki, V.; Laine, A. 1984 International Archives of Occupational and Environmental Health 54:355-365				

Magnesium
7439-95-4
Mg
AtW 24.305, MP 651 C, BP 1100 C, VP 1 mm Hg at 621 C, 10 mm Hg at 740 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9486 Aorta	a) 8 b) 6 c) 7	a) 1400-2600 ppm Dry wt b) 270-830 ppm Dry wt c) Not given	a) Not given b) Not given c) 700+/-230 ppm Dry wt	a) Sclerotic aorta from metal-workers b) Normal aorta from metal-workers c) Normal aorta from non metal-workers 45-66 yr old workers. Autopsies, Japan, 1976-1977. Employed 7-32 yr JS
AORTA; VERTEBRAE; BONES; ENVIRONMENTAL EXPOSURE; OCCUPATIONAL EXPOSURE; JAPAN; AUTOPSIES; CADAVERS; CARDIOVASCULAR DISEASES; MINERALS; BIOACCUMULATION; DIETS; FOODS; MINERAL DEPOSITS; CALCIUM; PHOSPHORUS; IRON; MAGNESIUM; ZINC; ALUMINUM; COPPER; CADMIUM; LEAD; NICKEL; VANADIUM; CHROMIUM; MANGANESE; SILICON; TIN; TITANIUM; STRONTIUM Terachu, H. 1984 Archives of Environmental Contamination and Toxicology 13:119-127				

Tissue	Cases Exposure Route	Range	Mean	General Information
9487 Blood, plasma	a) 30 b) 32 c) 55 Ingestion	a) Not given b) Not given c) Not given	a) 0.89+/-0.01 mmol/l b) 0.84+/-0.01 mmol/l c) 0.95+/-0.02 mmol/l, S.E.	a) Fasting non-diabetics b) Insulin-treated diabetics c) Non-insulin-treated diabetics Levels inversely related to plasma glucose in b) and c), and positively correlated to disposal rate of IV glucose. Diabetics and non-diabetics, England NA
BLOOD PLASMA; UNITED KINGDOM; DIABETES; MAGNESIUM; METABOLISM Yajnik, C.S.; Smith, R.F.; Hockaday, T.D.R.; Ward, N.I. 1984 British Medical Journal 288:1032-1034				

Magnesium

7439-95-4
Mg
AtW 24.305, MP 651 C, BP 1100 C, VP 1 mm Hg at 621 C, 10 mm Hg at 740 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9488 Blood, plasma	14 Ingestion	a) Not given b) Not given c) Not given d) Not given e) Not given f) Not given g) Not given h) Not given	a) 0.80+/-0.06 mmol b) 0.84+/-0.03 mmol c) 0.81+/-0.02 mmol d) 0.81+/-0.02 mmol e) 0.77+/-0.04 mmol f) 0.91+/-0.03 mmol g) 0.93+/-0.02 mmol h) 0.96+/-0.07 mmol S.E.	a) Infants fed mothers' milk, start of study, 6 cases b) At 1 wk, 6 cases c) At 2 wk, 6 cases d) At 4 wk, 5 cases e) Infants fed formula, start of study, 5 cases f) At 1 wk, 7 cases g) At 2 wk, 6 cases h) At 4 wk (+ supplements NaHCO3, Ca-lactate), 5 cases Significant increase over 4 wk ($p<0.05$) in both groups. Premature infants, birth wt <1.5 kg, mean gestational age 28 wk, Canada AAS; ES
PREMATURE INFANTS; CANADA; NUTRITIONAL DEFICIENCIES; BLOOD PLASMA; MILK; COMPARATIVE EVALUATIONS; CALCIUM; MAGNESIUM; MINERALS; PHOSPHORUS; POTASSIUM; SODIUM; FOODS; LACTATION; DELIBERATE EXPOSURE Atkinson, S.A.; Radde, I.C.; Anderson, G.H. 1983 Journal of Pediatrics 102(1):99-106				

Tissue	Cases Exposure Route	Range	Mean	General Information
9489 Blood, plasma		a) Not given b) Not given c) Not given	a) 20.8+/-1.17 ug/mL b) 23.1+/-3.20 ug/mL c) 21.194+/-1.70 ug/mL	a) Insulin-treated diabetics b) Non-insulin-treated diabetics c) Control non-diabetics Collected after overnight fasting. Significant differences among all groups. 18-76 yr olds, Oxford, England NA; AAS
BLOOD PLASMA; ENGLAND; DIABETES; METABOLISM; MINERAL METABOLISM; ALUMINUM; ANTIMONY; ARSENIC; BARIUM; BROMINE; CADMIUM; CALCIUM; CESIUM; CHROMIUM; COBALT; COPPER; IODINE; IRON; LEAD; MAGNESIUM; MANGANESE; MERCURY; MOLYBDENUM; NICKEL; RUBIDIUM; SCANDIUM; SELENIUM; SILVER; TIN; VANADIUM; ZINC Ward, N.I.; Pim, B. 1984 Biological Trace Element Research 6:469-487				

Tissue	Cases Exposure Route	Range	Mean	General Information
9490 Blood, serum	a) 71 b) 17 c) 8 Ingestion	a) =/>16 mg/L b) 15-17 mg/L c) <15 mg/L	a) Not given b) Not given c) Not given	a) 44, cardiac arrhythmia within 48 hr, 27 had none. Considered normal level of Mg b) 9, cardiac arrhythmia within 48 hr, 6 had none c) 2, cardiac arrhythmia within 48 hr, 1 had none Measured at admission. Significant correlation between K and Mg levels whether patient receiving diuretics or not. No strong predictive relationship between mildly decreased Mg levels (resulting from diuretics) and onset of arrhythmia. Patients in University of Virginia Medical Center Coronary Care Unit ACA discrete analy
BLOOD SERUM; VIRGINIA; HEART DISEASES; COMPARATIVE EVALUATIONS; MAGNESIUM; POTASSIUM Boyd, J.C.; Bruns, D.E.; DiMarco, J.P.; Sugg, N.K.; Wills, M.R. 1984 Clinical Chemistry 30(5):754-757				

Magnesium

7439-95-4
Mg
AtW 24.305, MP 651 C, BP 1100 C, VP 1 mm Hg at 621 C, 10 mm Hg at 740 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9491 Blood, serum	188	a) Not given b) Not given c) 21+/-2-25+/-2 mg/L d) Not given e) Not given S.E.	a) 22+/-1 mg/L b) 17+/-2 mg/L c) Not given d) 14 mg/L e) 15 mg/L S.E.	a) 30 controls b) 27 patients with myocardial ischemia c) 131 others d) 36 patients with acute myocardial infarction, 21-30 hr after last chest pains e) Patients in d) 72 hr after last chest pains Significant differences: a) and b), d) and e) from initial value. d), e) estimated from graph Controls from group 30-56 yr olds, 24% family history of ischemia. 19 males, 8 females, 47 yr olds, 50% smokers, 26% family history of ischemia. Others, different heart diseases and hypertension Chem
BLOOD SERUM; HEART DISEASES; HYPERTENSION; TRACE ELEMENTS; COPPER; ZINC; IRON; NICKEL; COBALT; SODIUM; POTASSIUM; CALCIUM; MAGNESIUM; PAKISTAN; COMPARATIVE EVALUATIONS; CHOLESTEROLS Khan, S.N.; Rahman, M.A.; Samad, A. 1984 Clinical Chemistry 30(5):644-648				

Tissue	Cases Exposure Route	Range	Mean	General Information
9492 Bone	1	Not given	1400+/-270 ppm Dry wt	Lumbar vertebrae (n=5). Chromate plating worker, employed 7 yr, died at age 66, 30 yr after changing jobs ES
AORTA; VERTEBRAE; BONES; ENVIRONMENTAL EXPOSURE; OCCUPATIONAL EXPOSURE; JAPAN; AUTOPSIES; CADAVERS; CARDIOVASCULAR DISEASES; MINERALS; BIOACCUMULATION; DIETS; FOODS; MINERAL DEPOSITS; CALCIUM; PHOSPHORUS; IRON; MAGNESIUM; ZINC; ALUMINUM; COPPER; CADMIUM; LEAD; NICKEL; VANADIUM; CHROMIUM; MANGANESE; SILICON; TIN; TITANIUM; STRONTIUM Terachs, H. 1984 Archives of Environmental Contamination and Toxicology 13:119-127				

Tissue	Cases Exposure Route	Range	Mean	General Information
9493 Hair	a) 4 b) 6 c) 5 d) 11 e) 10	a) 114-164 ppm b) 100-303 ppm c) 96-467 ppm d) 150-600 ppm e) 24-723 ppm	a) 141 ppm b) 160 ppm c) 351 ppm d) 372 ppm e) 284 ppm	a) 1-15 yr olds, rural b) 15-25 yr olds, rural c) 25 yr olds, rural d) 15-25 yr olds, different areas of country e) All age groups, different areas of country 15-25 yr olds had highest levels of trace elements. Residents of Sri Lanka AAS
HAIR; ENVIRONMENTAL EXPOSURE; SRI LANKA; CHILDREN; ADULTS; LEAD POISONING; METAL POISONING; CALCIUM; MAGNESIUM; IRON; MANGANESE; COPPER; ZINC; LEAD; AUTOMOTIVE; AIR POLLUTION; BIOACCUMULATION; HEALTH HAZARDS; LAND POLLUTION; POPULATION EXPOSURE; RURAL AREAS; URBAN AREAS; AGE Dissanayake, C.B.; Senaratne, A.; Weerasooriya, S.V.R. 1984 Journal of Environmental Studies 23:41-48				

Magnesium
7439-95-4
Mg
AtW 24.305, MP 651 C, BP 1100 C, VP 1 mm Hg at 621 C, 10 mm Hg at 740 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9404 Hair	a) 60 b) 51 c) 5 d) 13	a) Not given b) Not given c) Not given d) Not given	a) 273+/-1.9 ug/g b) 280+/-1.8 ug/g c) 201+/-2.3 ug/g d) 277+/-3.1 ug/g Geometric means	a) Total, unwashed hair samples b) Hair pieces c) Needle-pads d) Others (undefined) In unwashed samples, no significant difference between sample types but levels higher ($p<0.01$) in samples from 1880-1949 than from 1950-1968. After washing (non-ionic surface active agent), no difference between 1911-1968 samples and 1961-1968. Japanese women. 1961-1963 samples from 22 workers at National Institute of Environmental Studies Atomic emission spectrometry; AAS

HAIR; ENVIRONMENTAL EXPOSURE; JAPAN; COMPARATIVE EVALUATIONS; CALCIUM; COPPER; IRON; LEAD; MAGNESIUM; MANGANESE; MERCURY; MERCURY ORGANIC COMPOUNDS; METALS; MINERALS; PHOSPHORUS; POTASSIUM; SODIUM; STRONTIUM; TRACE ELEMENTS; ZINC; OCCUPATIONAL EXPOSURE
Suzuki, T.; Hongo, T.; Morita, M.; Yamamoto, R. 1984 Science of the Total Environment 39:81-91

Tissue	Cases Exposure Route	Range	Mean	General Information
9406 Hair	6	a) 0-400 ug/g b) 10-800 ug/g c) 50-400 ug/g d) 0-850 ug/g e) 80-780 ug/g f) 50/600 ug/g Estimated from figure	a) 130 ug/g b) 62 ug/g c) 86 ug/g d) 110 ug/g e) 130 ug/g f) 75 ug/g	a) 0-40 cm from scalp, 7 yr old female b) 0-40 cm from scalp, 4 yr old female c) 0-30 cm from scalp, 7 yr old female d) 0-18 cm from scalp, 3 yr old female e) 0-15 cm from scalp, 2 yr old male f) 0-65 cm from scalp, 40 yr old female Range from total length, mean from 1st 10 cm from scalp. General increase in levels from scalp to tip. Japan NA

HAIR; ENVIRONMENTAL EXPOSURE; JAPAN; ADULTS; CHILDREN; COMPARATIVE EVALUATIONS; BROMINE; CALCIUM; CHLORINE; COPPER; IODINE; MAGNESIUM; MANGANESE; MERCURY; SELENIUM; ZINC; BIOINDICATORS
Yukawa, M.; Suzuki-Yasumoto, M.; Tanaka, S. 1984 Science of the Total Environment 38:41-54

Tissue	Cases Exposure Route	Range	Mean	General Information
9406 Milk	7	a) Not given b) Not given c) Not given	a) 1.20+/-0.09 mmol b) 1.21+/-0.09 mmol c) 1.13+/-0.11 mmol S.E.	a) 6-8 days postpartum b) 13-15 days postpartum c) 26-28 days postpartum Mothers of premature infants. Infant birth wt <1.5 kg, mean gestational age 28 wk, Canada AAS; ES

PREMATURE INFANTS; CANADA; NUTRITIONAL DEFICIENCIES; BLOOD PLASMA; MILK; COMPARATIVE EVALUATIONS; CALCIUM; MAGNESIUM; MINERALS; PHOSPHORUS; POTASSIUM; SODIUM; FOODS; LACTATION; DELIBERATE EXPOSURE
Atkinson, S.A.; Radde, I.C.; Anderson, G.H. 1983 Journal of Pediatrics 102(1):99-106

Magnesium
7439-95-4
Mg
AtW 24.305, MP 651 C, BP 1100 C, VP 1 mm Hg at 621 C, 10 mm Hg at 740 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9407 Semen	a) 25 b) 25	a) 14-18 mg % b) 2.56-21.43 mg %	a) Not given b) 9.1+/-5.9 mg %	a) Fertile controls b) Infertile patients Abnormal sperm motility and morphology AAS
FERTILITY; CALCIUM; MAGNESIUM; ZINC; INDIA; ADULTS; SEMEN; SPERM Pandy, V.K.; Parmeshwaran, M.; Soman, S.D.; Dacosta, J.C. 1988 Science of the Total Environment 27:49-52				

Mandelic acid (8 CI); Benzeneacetic acid, alpha-hydroxy- (9 CI)
90-64-2
C8-H8-O3
MW 152.14, MP 119 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9408 Urine	17	a) Not given b) Not given c) Not given d) Not given	a) 0.797 g/l b) 0.522 g/l c) 0.971 g/l d) 0.655 g/l	a) L-enantiomer, males b) D-enantiomer c) L-enantiomer, females, c) D-enantiomer Metabolites of styrene. Differences in ratios by sex not significant. Adult workers exposed to styrene GC
URINE; OCCUPATIONAL EXPOSURE; ADULTS; MEASUREMENT METHODS; METABOLITES; STYRENES Korn, M.; Wodarz, R.; Schoknecht, W.; Weichardt, H.; Bayer, E. 1984 Archives of Toxicology 55:89-93				

Tissue	Cases Exposure Route	Range	Mean	General Information
9409 Urine	a) 6 b) 4 c) 6 d) 6 Inhalation	a) 158-609 mg/l b) 475-952 mg/l c) 602-2100 mg/l d) 422-1565 mg/l	a) 348 mg/l b) 692 mg/l c) 1376 mg/l d) 731 mg/l	a) Solid waste container workers b) Duckboard workers c) Tank cylinder workers d) Tank finishing workers Mean air levels, 120-684 ul/l Correlation noted with styrenemia (r=0.6884), and with phenylglyoxylicuria (r=0.8017). Workers, fiberglass reinforced plastic factory HPLC
BLOOD; URINE; OCCUPATIONAL EXPOSURE; COMPARATIVE EVALUATIONS; STYRENES; AIR POLLUTION; BIOLOGICAL MONITORING; INHALATION; METABOLITES Apostoli, P.; Brugnone, F.; Perbellini, L.; Cocheo, V.; Bellomo, M.L.; Silvestri, R. 1984 American Journal of Industrial Medicine 4:741-754				

Mandelic acid (8 CI); Benzeneacetic acid, alpha-hydroxy- (9 CI)
90-64-2
C8-H8-O3
MW 152.14, MP 119 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9600 Urine	17 Inhalation Dermal	a) 1.0-5.7 mg/L b) 16.4-25.5% c) 32.7-55.0% d) 17.5-28.0% e) 20.2-51.6% f) Not given g) Not given h) <1-3 mg/L	a) 2.6+/-1.1 mg/L b) 21.4% c) 44.3% d) 21.5% e) 40.1% f) 22.6+/-0.8% g) 43.6 +/-1.5% h) Not applicable	a) Controls, 10 cases b) 8 hr exposure of 20.2-39.4 mg, 6 cases c) 14 hr after 8 hr exposure of 20.2-39.4 mg, 6 cases d) 8 hr exposure of 136.9-196.9 mg, 6 cases e) 14 hr after 8 hr exposure of 136.9-196.9 mg, 6 cases f) Mean, 8 hr exposure ranging from 20.2-447.6 mg, 6 cases g) Mean, 14 hr after 8 hr exposure ranging from 20.2-447.6 mg, 6 cases h) 1-6 hr after 1800 mg/cm dermal exposure, 1 case Molar % excreted after exposure to ethylbenzene, metabolite measured. Vapors do not enter body through skin. Healthy volunteers, 27-32 yr old GC
URINE; LUNGS; DELIBERATE EXPOSURE; POLAND; ADULTS; INDUSTRIAL DISEASES; INDUSTRIAL HYGIENE; INDUSTRIAL MEDICINE; BIOACCUMULATION; HEALTH HAZARDS; INDUSTRIAL ATMOSPHERES; INDUSTRIAL PLANTS; INHALATION; METABOLITES; OCCUPATIONAL HAZARDS Gromiec, J.P.; Piotrowski, J.K. 1986 International Archives of Occupational and Environmental Health 58:61-72				

Manganese
7439-96-5
Mn
AtW 54.9380, MP 1244 C, BP 2095 C, VP 1 mm Hg at 1292 C, 10 mm Hg at 1510 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9601 Aorta	a) 8 b) 6 c) 7	a) 1.8-11 ppm b) 0.67-1.3 ppm c) Not given Dry wt	a) Not given b) Not given c) 0.39+/-0.06 ppm Dry wt	a) Sclerotic aorta from metal-workers b) Normal aorta from metal-workers c) Normal aorta from non metal-workers 45-66 yr old workers. Autopsies, Japan, 1976-1977. Employed 7-32 yr ES
AORTA; VERTEBRAE; BONES; ENVIRONMENTAL EXPOSURE; OCCUPATIONAL EXPOSURE; JAPAN; AUTOPSIES; CADAVERS; CARDIOVASCULAR DISEASES; MINERALS; BIOACCUMULATION; DIETS; FOODS; MINERAL DEPOSITS; CALCIUM; PHOSPHORUS; IRON; MAGNESIUM; ZINC; ALUMINUM; COPPER; CADMIUM; LEAD; NICKEL; VANADIUM; CHROMIUM; MANGANESE; SILICON; TIN; TITANIUM; STRONTIUM Terada, H. 1986 Archives of Environmental Contamination and Toxicology 15:119-127				

Tissue	Cases Exposure Route	Range	Mean	General Information
9602 Blood	221	a) 1-88 ppb b) 1-158 ppb	a) 21+/-90 ppb b) 26+/-20 ppb	a) Maternal, 102 cases b) Cord, 94 cases Significant positive correlation. Determinations over 5-yr period. Nagoya, Japan, 1974-1978. Maternal venous and umbilical cord blood, normal deliveries. AAS
ZINC; MERCURY; METHYLMERCURY; LEAD; CADMIUM; MANGANESE; COPPER; IRON; JAPAN; BLOOD; PLACENTA; UMBILICAL CORD; METALS; ENVIRONMENTAL EXPOSURE Tsuchiya, H.; Mitani, K.; Kodama, K.; Nakata, T. 1986 Archives of Environmental Health 39(1):11-17				

Manganese
7439-96-5
Mn
AtW 54.9380, MP 1244 C, BP 2095 C, VP 1 mm Hg at 1292 C, 10 mm Hg at 1510 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9503 Blood, plasma		a) Not given b) Not given c) Not given	a) 0.0023+/-0.0004 ug/mL b) 0.0027+/-0.0007 ug/mL c) 0.0022+/-0.0004 ug/mL	a) Insulin-treated diabetics b) Non-insulin-treated diabetics c) Control non-diabetics Collected after overnight fasting. Significant differences between b), c) and a), b). 18-78 yr olds, Oxford, England NA; AAS
BLOOD PLASMA; ENGLAND; DIABETES; METABOLISM; MINERAL METABOLISM; ALUMINUM; ANTIMONY; ARSENIC; BARIUM; BROMINE; CADMIUM; CALCIUM; CESIUM; CHROMIUM; COBALT; COPPER; IODINE; IRON; LEAD; MAGNESIUM; MANGANESE; MERCURY; MOLYBDENUM; NICKEL; RUBIDIUM; SCANDIUM; SELENIUM; SILVER; TIN; VANADIUM; ZINC Ward, N.I.; Pim, B. 1984 Biological Trace Element Research 6:469-487				

Tissue	Cases Exposure Route	Range	Mean	General Information
9504 Blood, serum	a) 8 b) 16 Ingestion	a) 1.8-8.1 ug/L b) 1.8-8.1 ug/L	a) 4.4 +/- 1.8 ug/L b) 4.7 +/- 1.6 ug/L	a) Infants fed human milk b) Infants fed formula Champaign-Urbana, Illinois AAS
BLOOD SERUM; MILK; ILLINOIS; MANGANESE; LACTATION; ENVIRONMENTAL EXPOSURE; AGE; COMPARATIVE EVALUATIONS Steetny, D.; Vogel, R.S.; Picciano, M.F. 1984 American Journal of Clinical Nutrition 39:872-878				

Tissue	Cases Exposure Route	Range	Mean	General Information
9506 Bone	1	Not given	<2 ppm Dry wt	Lumbar vertebrae (n=5). Chromate plating worker, employed 7 yr, died at age 66, 30 yr after changing jobs ES
AORTA; VERTEBRAE; BONES; ENVIRONMENTAL EXPOSURE; OCCUPATIONAL EXPOSURE; JAPAN; AUTOPSIES; CADAVERS; CARDIOVASCULAR DISEASES; MINERALS; BIOACCUMULATION; DIETS; FOODS; MINERAL DEPOSITS; CALCIUM; PHOSPHORUS; IRON; MAGNESIUM; ZINC; ALUMINUM; COPPER; CADMIUM; LEAD; NICKEL; VANADIUM; CHROMIUM; MANGANESE; SILICON; TIN; TITANIUM; STRONTIUM Terasoka, H. 1984 Archives of Environmental Contamination and Toxicology 13:119-127				

Manganese

7439-96-5
Mn
AtW 54.9380, MP 1244 C, BP 2095 C, VP 1 mm Hg at 1292 C, 10 mm Hg at 1510 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9506 Breast	22	a) Not given b) Not given	a) 1.37+/-0.66 ug/g b) 1.42+/-0.73 ug/g	a) Normal tissue b) Neoplastic Dry wt, 3 samples, p=0.41 Patients with primary breast carcinomas, samples of normal and neoplastic tissue obtained at time of mastectomy X-ray fluorescence
BREAST; CALCIUM; VANADIUM; CHROMIUM; MANGANESE; IRON; NICKEL; COPPER; ZINC; ARSENIC; SELENIUM; BROMINE; RUBIDIUM; STRONTIUM; MOLYBDENUM; LEAD; MERCURY; NEOPLASMS Rish, S.L.; Shy-Poch, H.H. 1984 Cancer Research 44:5890-5894				

Tissue	Cases Exposure Route	Range	Mean	General Information
9507 Breast fluid	Ingestion	a) Not given b) Not given c) Not given d) Not given	a) 16.6+/-7.9 ug/g b) 10.8+/-3.4 ug/g c) 7.8+/-4.6 ug/g d) 11.5+/-3.2 ug/g	a) Middle income, 3-5 days post partum, 6 cases b) Low income, 3-5 days post partum, 9 cases c) Middle income, 4-6 wks post partum, 8 cases d) Low income, 4-6 wks post partum, 8 cases Differences not statistically significant Mothers in Hyderabad, India NA
MILK; INDIA; ADULTS; COPPER; MANGANESE; MOLYBDENUM; ZINC; DIETS; LACTATION; NEWBORN; NUTRITIONAL DEFICIENCIES Dang, H.S.; Jaiswal, D.D.; Somasundaram, S.; Deshpande, A.; Dacosta, H. 1984 Science of the Total Environment 35: 85-89				

Tissue	Cases Exposure Route	Range	Mean	General Information
9508 Hair	15	0.20-0.30 ug/g Dry wt	0.26+/-0.05 ug/g Dry wt	Unexposed subjects used in developing technique for minimising Mg contamination or loss in digestion. Procedure considered sensitive, reproducible, suitable for analysis of trace levels. Healthy, dark-haired men, 30-45 yr old, France AAS
HAIR; FRANCE; ADULTS; MEASUREMENT METHODS; MANGANESE Guillard, O.; Brugier, J.C.; Pirlou, A.; Menard, M.; Gombert,J.; Reise, D. 1984 Clinical Chemistry 30(10):1642-1645				

Manganese
7439-96-5
Mn
AtW 54.9380, MP 1244 C, BP 2095 C, VP 1 mm Hg at 1292 C, 10 mm Hg at 1510 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9809 Hair	a) 10 b) 10 c) 10 d) 10 e) 20 f) 10 g) 16 h) 44 Ingestion	a) Not given b) Not given c) Not given d) Not given e) Not given f) Not given g) Not given h) Not given	a) 0.19+/-0.11 ug/g b) 0.965+/-0.89 ug/g c) 0.685+/-0.26 ug/g d) 0.330+/-0.15 ug/g e) 0.587+/-0.55 ug/g f) 0.898+/-0.21 ug/g g) 0.434 ug/g h) 0.268 ug/g	a) Newborn, formula-fed b) 6 wk old (range 3-8 wk), formula-fed c) 4 mo old (range 3-5 mo), formula-fed d) 4 mo old (range 2-24 mo), breast-fed e) 9 mo old (range 7-12 mo), formula-fed 8 mo f) 3 yr old (range 2-4 yr), formula-fed 7 mo g) 7-10 yr old learning disabled children h) 7-10 yr old normal children Samples from children having routine checkups at pediatric clinics and a health care center. Children with learning disabilities, hyperactivity were referrals. AAS
UNITED STATES; CHILDREN; INFANTS; NEWBORN; LEARNING DISABILITIES; HAIR; MILK; COMPARATIVE EVALUATIONS; MANGANESE; FOOD ADDITIVES; ENVIRONMENTAL EXPOSURE; CONSUMER EXPOSURE Collipp, D.P.J.; Chen, S.Y.; Maltinsky, S. 1984 Annals of Nutrition and Metabolism 27:488-494				

Tissue	Cases Exposure Route	Range	Mean	General Information
9810 Hair	a) 44 b) 24	a) 0.4-26 ppm b) 0.18-4.3 ppm	a) 4.4 ppm b) 1.4 ppm	a) Pottery workers b) Controls Pottery workers from Tlaquepaque and Tonala, Mexico. Controls from Tucson, AZ NA
HAIR; OCCUPATIONAL EXPOSURE; ARIZONA; MEXICO; ADULTS; LEAD; CADMIUM; ARSENIC; VANADIUM; GOLD; ZINC; COPPER; IRON; MANGANESE; POTASSIUM Weber, C.W.; Nelson, G.W.; deVaquera, M.V.; Pearson, P.B. 1984 Nutrition Reports International 30(5):1009-1018				

Tissue	Cases Exposure Route	Range	Mean	General Information
9811 Hair		Not given	15 ug/g	Kenya. Considered high. Levels 3-4 ug/g in countries such as Nigeria, India, Thailand, Pakistan. Most others, 0.5-1.5 ug/g. Levels from database containing data on "normal" levels of 15 elements in 7 tissues/fluids. Data selected by 60 investigators in over 40 countries. Diet, environment both important in distribution of elements.
ZINC; COPPER; MANGANESE; SELENIUM; LEAD; CADMIUM; BLOOD; BLOOD SERUM; HAIR; MILK; BANGLADESH; INDIA; TURKEY; FINLAND; ITALY; NEW ZEALAND; GUATEMALA; CHILE; SWEDEN; HUNGARY; YUGOSLAVIA; POLAND; KENYA; EGYPT; SOUTH AFRICA; UNITED STATES; AUSTRALIA; GREECE; PAKISTAN; NIGERIA; PHILIPPINES; ZAIRE; THAILAND; CHINA; WYOMING; OHIO; CALIFORNIA; JAPAN; MEXICO; CANADA; ISRAEL; PERU; SPAIN; COMPARATIVE EVALUATIONS; BIOLOGICAL MONITORING; IRAN; DIETS; ENVIRONMENTAL EXPOSURE Iyengar, G.V. 1984 Science of the Total Environment 38:135-151				

Manganese
7439-96-5
Mn
AtW 54.9380, MP 1244 C, BP 2095 C, VP 1 mm Hg at 1292 C, 10 mm Hg at 1510 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9512 Hair	a) 4 b) 6 c) 5 d) 11 e) 10	a) 9-27 ppm b) 3-56 ppm c) 4-106 ppm d) 43-310 ppm e) 18-120 ppm	a) 19 ppm b) 20 ppm c) 53 ppm d) 126 ppm e) 45 ppm	a) 1-15 yr olds, rural b) 15-25 yr olds, rural c) 25 yr olds, rural d) 15-25 yr olds, different areas of country e) All age groups, different areas of country 15-25 yr olds had highest levels of trace elements. Residents of Sri Lanka AAS

HAIR; ENVIRONMENTAL EXPOSURE; SRI LANKA; CHILDREN; ADULTS; LEAD POISONING; METAL POISONING; CALCIUM; MAGNESIUM; IRON; MANGANESE; COPPER; ZINC; LEAD; AUTOMOTIVE; AIR POLLUTION; BIOACCUMULATION; HEALTH HAZARDS; LAND POLLUTION; POPULATION EXPOSURE; RURAL AREAS; URBAN AREAS; AGE
Dissanayake, C.B.; Senaratne, A.; Weerasooriya, S.V.R. 1984 Journal of Environmental Studies 23:41-48

Tissue	Cases Exposure Route	Range	Mean	General Information
9513 Hair	a) 69 b) 51 c) 5 d) 15	a) Not given b) Not given c) Not given d) Not given	a) 28.0+/-3.0 ug/g b) 32.9+/-1.9 ug/g c) 10.9+/-2.1 ug/g d) 7.5+/-5.6 ug/g Geometric means	a) Total, unwashed hair samples b) Hair pieces c) Needle-pads d) Others (undefined) In unwashed samples, significant difference between sample types ($p<0.001$), levels higher ($p<0.001$) in samples from 1880-1940 then from 1950-1960. After washing (non-ionic SAA), levels significantly higher in 1911-1960 samples than in 1961-1985. Japanese women. 1961-1985 samples from 22 workers at National Institute of Environmental Studies Atomic emission spectrometry; AAS

HAIR; ENVIRONMENTAL EXPOSURE; JAPAN; COMPARATIVE EVALUATIONS; CALCIUM; COPPER; IRON; LEAD; MAGNESIUM; MANGANESE; MERCURY; MERCURY ORGANIC COMPOUNDS; METALS; MINERALS; PHOSPHORUS; POTASSIUM; SODIUM; STRONTIUM; TRACE ELEMENTS; ZINC; OCCUPATIONAL EXPOSURE
Suzuki, T.; Hongo, T.; Morita, M.; Yamamoto, R. 1984 Science of the Total Environment 39:81-91

Tissue	Cases Exposure Route	Range	Mean	General Information
9514 Hair	a) 51 b) 52	a) 0.11-0.27 ug/g b) 0.12-0.26 ug/g 25th-75th percentiles	a) 0.16 ug/g b) 0.17 ug/g Medians	a) Drank hard tapwater (mean hardness 380 ppm) at least 1 yr b) Drank soft tapwater (mean hardness 33 ppm) No significant difference Healthy Caucasian preschool children matched by age (4.5-5.5 yr old), sex, and socioeconomic status, Guelph, Ontario (hard water area) and Halifax, Nova Scotia (soft water area), Canada NA

CANADA; AGE; CHILDREN; SEX; NUTRITIONAL DEFICIENCIES; HAIR; CALCIUM; COPPER; MANGANESE; ZINC; DRINKING WATER; ENVIRONMENTAL EXPOSURE; DELIBERATE EXPOSURE
Gibson, R.S.; Anderson, B.M.; Scythes, C.A. 1983 American Journal of Clinical Nutrition 37:37-42

Manganese
7439-96-5
Mn
AtW 54.9380, MP 1244 C, BP 2095 C, VP 1 mm Hg at 1292 C, 10 mm Hg at 1510 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9515 Hair	6	a) 1.6-6.7 ug/g b) 0.4-3.3 ug/g c) 0-3.3 ug/g d) 0-6.0 ug/g e) 1.0-3.2 ug/g f) 0-2.5 ug/g Estimated from figure	a) 2.1 ug/g b) 0.59 ug/g c) 0.59 ug/g d) 0.95 ug/g e) 1.9 ug/g f) 0.43 ug/g	a) 0-40 cm from scalp, 7 yr old female b) 0-40 cm from scalp, 4 yr old female c) 0-30 cm from scalp, 7 yr old female d) 0-18 cm from scalp, 3 yr old female e) 0-15 cm from scalp, 2 yr old male f) 0-65 cm from scalp, 40 yr old female Range from total length, mean from 1st 10 cm from scalp. No definite concentration pattern due to difference among individuals. Japan NA

HAIR; ENVIRONMENTAL EXPOSURE; JAPAN; ADULTS; CHILDREN; COMPARATIVE EVALUATIONS; BROMINE; CALCIUM; CHLORINE; COPPER; IODINE; MAGNESIUM; MANGANESE; MERCURY; SELENIUM; ZINC; BIOINDICATORS
Yukawa, M.; Suzuki-Yasumoto, M.; Tanaka, S. 1984 Science of the Total Environment 38:41-54

Tissue	Cases Exposure Route	Range	Mean	General Information
9516 Liver	36	a) 0.47-2.46 ug/g b) 0.59-2.07 ug/g	a) 1.36 ug/g b) 1.22 ug/g	a) 1 sample per liver (36), AAS b) 2 replicates per liver, NA Normal tissues from autopsies. Baltimore, MD, Minneapolis, MN; Seattle, WA AAS; NA

LIVER; ENVIRONMENTAL EXPOSURE; AUTOPSIES; COMPARATIVE EVALUATIONS; MEASUREMENT METHODS; ALUMINUM; CADMIUM; COPPER; LEAD; MANGANESE; SELENIUM; ZINC
Zeisler, R.; Harrison, S.H.; Wise, S.A. 1984 Biological Trace Element Research 6:31-49

Tissue	Cases Exposure Route	Range	Mean	General Information
9517 Liver	96	a) 0.8-2.3 mg/kg b) 0.7-3.3 mg/kg	a) 1.45+/-0.37 mg/kg b) 1.47+/-0.43 mg/kg	a) Females b) Males Autopsies. Levels generally lower than those in other countries. No major regional variations. New Zealanders. Death by physical injuries AAS

LIVER; COMPARATIVE EVALUATIONS; ARSENIC; CADMIUM; CHROMIUM; COBALT; COPPER; NEW ZEALAND; AUTOPSIES; LEAD; MANGANESE; MERCURY; NICKEL; SELENIUM; SILVER; ZINC
Pickston, L.; Lewin, J.F.; Drysdale, J.M.; Smith, J.M.; Bruce, J. 1983 Journal of Analytical Toxicology 7:2-6

Manganese

7439-96-5

Mn

AtW 54.9380, MP 1244 C, BP 2095 C, VP 1 mm Hg at 1292 C, 10 mm Hg at 1510 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9518 Milk	18	a) Not given b) Not given c) Not given	a) 6.6+/-4.7 ug/L b) 4.8+/-1.8 ug/L c) 3.5+/-1.4 ug/L	a) 4 wk lactation b) 8 wk lactation c) 12 wk lactation 35, 40, 41 samples respectively. Overall range 1.9-27.5 ug/L, mean 4.9+/-3.9 ug/L. a) differs significantly from b), c) ($p < 0.05$). The Mn concentration did not significantly vary within a single day, on consecutive days or within a single feeding. Champaign-Urbana, Illinois AAS

BLOOD SERUM; MILK; ILLINOIS; MANGANESE; LACTATION; ENVIRONMENTAL EXPOSURE; AGE; COMPARATIVE EVALUATIONS

Stastny, D.; Vogel, R.S.; Picciano, M.F. 1984 American Journal of Clinical Nutrition 39:872-878

Tissue	Cases Exposure Route	Range	Mean	General Information
9519 Milk		a) Not given b) Not given c) Not given	a) 40 ng/ml b) 16 ng/ml c) 11 ng/ml	a) Phillipines b) Nigeria c) Zaire Considered high. Levels typically 3-6 ng/ml in Hungary, Yugoslavia, Sweden, Finland. Levels from database containing data on "normal" levels of 15 elements in 7 tissues/fluids. Data selected by 60 investigators in over 40 countries. Diet, environment both important in distribution of elements.

ZINC; COPPER; MANGANESE; SELENIUM; LEAD; CADMIUM; BLOOD; BLOOD SERUM; HAIR; MILK; BANGLADESH; INDIA; TURKEY; FINLAND; ITALY; NEW ZEALAND; GUATEMALA; CHILE; SWEDEN; HUNGARY; YUGOSLAVIA; POLAND; KENYA; EGYPT; SOUTH AFRICA; UNITED STATES; AUSTRALIA; GREECE; PAKISTAN; NIGERIA; PHILIPPINES; ZAIRE; THAILAND; CHINA; WYOMING; OHIO; CALIFORNIA; JAPAN; MEXICO; CANADA; ISRAEL; PERU; SPAIN; COMPARATIVE EVALUATIONS; BIOLOGICAL MONITORING; IRAN; DIETS; ENVIRONMENTAL EXPOSURE

Iyengar, G.V. 1984 Science of the Total Environment 38:125-131

Tissue	Cases Exposure Route	Range	Mean	General Information
9520 Milk	a) 10 b) 16 c) 5	a) 21-81 ug/kg b) 6-48 ug/kg c) 8.0-47 ug/kg Dry wt	a) 42+/-18 ug/kg b) 27+/-14 ug/kg c) 27.1+/-17.6 ug/kg Dry wt	a) Colostrum (1st or 2nd day post partum) b) Transitional milk (3-8 days post partum) c) Mature milk (1-6 mo post partum) Slovenia, Yugoslavia NA

MILK; ARSENIC; CADMIUM; COBALT; COPPER; MERCURY; IODINE; MANGANESE; ANTIMONY; SELENIUM; VANADIUM; ZINC; YUGOSLAVIA; ENVIRONMENTAL EXPOSURE

Kosta, L.; Byrne, A.R.; Dermelj, M. 1983 Science of the Total Environment 29:261-268

Manganese

7439-96-5

Mn

AtW 54.9380, MP 1244 C, BP 2095 C, VP 1 mm Hg at 1292 C, 10 mm Hg at 1510 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9521 Placenta	231	2-116 ppb	40+/-24 ppb	113 cases Nagoya, Japan, 1974-1978. Normal deliveries. AAS
9522 Umbilical cord	231	8-156 ppb	41+/-27 ppb	112 cases Nagoya, Japan, 1974-1978. Normal deliveries. AAS
ZINC; MERCURY; METHYLMERCURY; LEAD; CADMIUM; MANGANESE; COPPER; IRON; JAPAN; BLOOD; PLACENTA; UMBILICAL CORD; METALS; ENVIRONMENTAL EXPOSURE Tsuchiya, H.; Mitani, K.; Kodama, K.; Nakata, T. 1984 Archives of Environmental Health 39(1):11-17				

Mercury

7439-97-6

Hg

AtW 200.59, MP -38.87 C, BP 356.72 C, VP 2X10(E-3) mm Hg at 25 C, 100 mm Hg at 260 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9523 Blood	4	a) 0-300 nmol/L b) 0-700 nmol/L c) 40-150 nmol/L d) 10-280 nmol/L	a) Not given b) Not given c) Not given d) Not given	a) 14 yr old girl, days 24-175, peak 30 days b) 41 yr old father, days 28-175, peak 38 days c) 10 yr old boy, days 32-175, peak 32 days d) 38 yr old mother, days 44-123, peak 57 days Family exposed to metallic Hg vapor from spill on furniture and carpet. Mother, father and girl showed symptoms of poisoning. Values estimated from figure. Family in London, England Acrodynia, nephrotic syndrome
BLOOD; ENVIRONMENTAL EXPOSURE; UNITED KINGDOM; ADULTS; CHILDREN; METAL POISONING; MERCURY; ACCIDENTAL POISONING; METALS McNeil, N.I.; Izsiep, H.C.; Oliver, R.E.; Wrong, O.M. 1984 Lancet 1(8371):269-271				

Mercury
7439-97-6
Hg
AtW 200.59, MP -38.87 C, BP 356.72 C, VP 2X10(E-3) mm Hg at 25 C, 100 mm Hg at 260 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9524 Blood	154 Ingestion	a) Not given b) Not given c) Not given d) Not given e) Not given f) Not given g) Not given h) Not given	a) 0.32 umol/l b) 0.24 umol/l c) 0.15 umol/l d) 0.10 umol/l e) 0.11 umol/l f) 0.09 umol/l g) 0.03 umol/l h) 0.02 umol/l	a) 27 males, more than 6 seal meals/wk b) 35 females c) 12 males, 1-6 seal meals/wk d) 8 females e) 12 males, 1 seal meal or less/wk f) 24 females g) 9 males, Danes, eat predominately imported food h) 9 females, Danes Dietary Hg exposure less hazardous when food chain includes surplus of antagonistic elements, i.e., selenium. Residents of Angmagssalik, East Greenland. Danes temporarily in Greenland. AAS

BLOOD; HAIR; ENVIRONMENTAL EXPOSURE; DENMARK; GREENLAND; AGE; MERCURY; SELENIUM; DIETS; BIOACCUMULATION
Hansen, J.C.; Kromann, N.; Wulf, H.C.; Alboge, K. 1984 Science of the Total Environment 38:33-40

Tissue	Cases Exposure Route	Range	Mean	General Information
9525 Blood	231	a) 1-542 ng/g b) 1-735 ng/g	a) 19+/-36 ng/g b) 30+/-62 ng/g	a) Maternal, 231 cases b) Cord, 231 cases Significant positive correlation. Determinations over 5-yr period. Nagoya, Japan, 1974-1978. Maternal venous and umbilical cord blood, normal deliveries. AAS

ZINC; MERCURY; METHYLMERCURY; LEAD; CADMIUM; MANGANESE; COPPER; IRON; JAPAN; BLOOD; PLACENTA; UMBILICAL CORD; METALS; ENVIRONMENTAL EXPOSURE
Tsuchiya, H.; Mitani, K.; Kodama, K.; Nakata, T. 1984 Archives of Environmental Health 39(1):11-17

Tissue	Cases Exposure Route	Range	Mean	General Information
9526 Blood	a) 25 b) 22	a) Not applicable b) 0.75-10.52 ug/100 ml	a) <0.6 ug/100 ml b) 3.06 ug/100 ml	a) Controls b) Exposed 4 yr to vapor. No increase in structural chromosome aberrations Male workers (mean age 41.5 yr) at Hg amalgamation and chloralkali plant. Half were smokers. Controls, mean age 40.1 yr. AAS

URINE; BLOOD; OCCUPATIONAL EXPOSURE; ADULTS; COMPARATIVE EVALUATIONS; MERCURY; INDUSTRIAL ATMOSPHERES; CHROMOSOMAL ABERRATIONS
Mabille, V.; Roels, H.; Jacquet, P.; Leonard, A.; Lauwerys, R. 1984 International Archives of Occupational and Environmental Health 53:257-260

Mercury
7439-97-6
Hg
AtW 200.59, MP -38.87 C, BP 356.72 C, VP 2X10(E-3) mm Hg at 25 C, 100 mm Hg at 260 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9527 Blood	a) 81 b) 96	a) Not given b) 5-70 ug/l	a) < 5ug/l b) 17.5 ug/l	a) Controls b) Exposed Exposure over mean of 8.0 yr (range 1-33 yr). Both groups, no exposure to Cd or Pb in previous 5 yr. Controls, levels <15 ug/l before study. Significant correlation between blood and urine concentrations 16.5-61.3 yr old (mean age 38.2) mercury exposed chlor-alkali plant workers and 20.0-61.3 yr old (mean age 41.4) chemical plant workers (controls), United Kingdom UV
BLOOD; URINE; OCCUPATIONAL EXPOSURE; UNITED KINGDOM; ADULTS; MERCURY; METALS Stonard, M.D.; Chater, B.V.; Duffield, D.P.; Nevitt, A.L.; O'Sullivan, J.J.; Steel, G.T. 1983 International Archives of Occupational and Environmental Health 52:177-189				

Tissue	Cases Exposure Route	Range	Mean	General Information
9528 Blood	a) 10 b) 10 c) 10 Inhalation	a) Not given b) Not given c) Not given	a) 20.5+/-7.2 nmol/l b) 74.0+/-19.8 nmol/l c) 64.5+/-35.5 nmol/l	a) Unexposed b) Exposed on day of study c) Exposed only before study Total Hg. Data for organic and inorganic Hg in nmol/l were, respectively: 11+/-6.2, 15.5+/-6, 20+/-8.2 and 9.5+/-3.7, 58.5+/-20.6, 44.5+/-30 Plasma lysosomal hydrolase activities not of great value in monitoring exposures to low levels. Workers, 34.8+/-8.9 yr old (21-53). Controls 39.8+/-12.4 yr old. Mean exposure time 9.4+/-4.4 yr (1-12). All clinically healthy AAS
MERCURY; METALS; BLOOD; URINE; OCCUPATIONAL EXPOSURE; AIR POLLUTION; OCCUPATIONAL HAZARDS; DIURNAL VARIATIONS; ENZYMES Aitio, A.; Valkonen, S.; Kivisto, H.; Yrjanheikki, E. 1983 International Archives of Occupational and Environmental Health 53:139-147				

Tissue	Cases Exposure Route	Range	Mean	General Information
9529 Blood	1 Ingestion	700-355 ng/ml	Not applicable	0-10 days, peak (2800 Ng/ml) 2 hr after estimated 45 mg methylmercury. Subject treated sequentially with oral D-penicillamine (500 mg/b hr for 1 d), hemodialysis with infusion of N-acetylcysteine (5.3 hr), and oral 2,3-Dimercaptopropane sulfate 200 mg/6 hr for 14 d. No toxic effects observed 1 yr after episode. 20 yr old ingested 25 haloperidol tablets, 25 benztropine tablets, and "2 or 3 large gulps" of fungicide containing 0.69% methylmercury. AAS
BLOOD; URINE; DELIBERATE EXPOSURE; ADULTS; SUICIDE; NEUROLOGIC MANIFESTATIONS; HEMODIALYSIS; HALOGENS; METHYL MERCURY COMPOUNDS; FUNGICIDES; BIOACCUMULATION; BIOLOGICAL MONITORING; HEALTH HAZARDS Lund, M.E.; Banner, W., Jr.; Clarkson, T.W.; Berlin, M. 1984 Clinical Toxicology 22(1):81-94				

Mercury
7439-97-6
Hg
AtW 200.59, MP -38.87 C, BP 356.72 C, VP 2X10(E-3) mm Hg at 25 C, 100 mm Hg at 260 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9530 Blood	1 Ingestion	a) Not given b) Not given c) Not given d) Not given e) Not given f) Not given g) Not given	a) 4.5 mg/l b) 0.95 mg/l c) 0.68 mg/l d) 0.30 mg/l e) 0.06 mg/l f) 0.004 mg/l g) 0.001 mg/l	a) 1 day b) 2 days c) 5 days d) 8 days e) 32 days f) 102 days g) 161 days Times after ingestion of unknown quantity as chloride. Dimercaprol given days 1-4. 23 mo old Edema and ulceration of tongue and lips, mild renal function impairment Peak blood urea on day 4 (14 mmol/l), peak serum creatimine on day 6 (114 umol/l)

DELIBERATE EXPOSURE; UNITED KINGDOM; CASE HISTORIES; CHILDREN; METAL POISONING; BLOOD; URINE; MERCURY INORGANIC COMPOUNDS; ACCIDENTAL POISONING
Stack, T.; Bissenden, J.G.; Hoffman, G.; Yeoman, W.B. 1983 British Medical Journal 287:1513

Tissue	Cases Exposure Route	Range	Mean	General Information
9531 Blood	3 Ingestion	0.18-0.24 ppm	Not given	Persons with hair levels 18.1-64.0 ppm Fishermen, mean fish intake 80-100 kg/person/yr, Republic of Seychelles. AAS

SEYCHELLES; ADULTS; NEWBORN; BLOOD; HAIR; MERCURY; METALS; BIOACCUMULATION; DIETS; FISHES; POPULATION EXPOSURE
Matthews, A.D. 1983 Environmental Research 30:305-312

Tissue	Cases Exposure Route	Range	Mean	General Information
9532 Blood	a) 38 b) 12 c) 17 d) 14 e) 41 f) 14 g) 35 h) 11 Ingestion	a) Not given b) Not given c) Not given d) Not given e) Not given f) Not given g) Not given h) Not given	a) 62.5 ug/l b) 35.3 ug/l c) 22.2 ug/l d) 5.8 ug/l e) 47.5 ug/l f) 24.5 ug/l g) 19.6 ug/l h) 3.9 ug/l	a) Seal eaten 6x/wk, males b) Seal eaten 2-5x/wk, males c) Seal eaten <or= 1x/wk, males d) Controls, males e) Seal eaten 6x/wk, females f) Seal eaten 2-5x/wk, females g) Seal eaten <or= 1x/wk, females h) Controls, females 23-37 yr old Eskimoes (Greenland), 30-35 yr old controls (Danes) AAS

MERCURY; DIETS; HEALTH HAZARDS; BLOOD; HAIR; COMPARATIVE EVALUATIONS; DENMARK; GREENLAND; METAL POISONING; ENVIRONMENTAL EXPOSURE
Hansen, J.C.; Wulf, H.C.; Kromann, N.; Alboge, K. 1983 Science of the Total Environment 36:233-343

Mercury
7439-97-6
Hg
AtW 200.59, MP -38.87 C, BP 356.72 C, VP 2X10(E-3) mm Hg at 25 C, 100 mm Hg at 260 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9533 Blood	a) 114 b) 131 c) 48 d) 54 Inhalation	a) 0.06-0.39 ug/dl b) 0.30-7.56 ug/dl c) 0.08-0.50 ug/dl d) 0.28-1.52 ug/dl	a) 0.20+/-0.08 ug/dl b) 1.43+/-1.17 ug/dl c) 0.23+/-0.08 ug/dl d) 0.90+/-0.30 ug/dl	a) Unexposed male factory workers b) Exposed male workers c) Unexposed female factory workers d) Exposed female workers Exposed to Hg vapor. Male and female factory workers, ages 30.9 and 29.9 yr, exposure durations 4.8 and 7 yr. Matched controls. Belgium Memory disturbances, depression, fatigue, irritability, tremors Renal tubular effects: increased urinary Beta-galactosidase activity, excretion of retinol-binding protein AAS

MERCURY; BLOOD; URINE; OCCUPATIONAL EXPOSURE; SEX; BELGIUM; HEALTH HAZARDS; OCCUPATIONAL HAZARDS; INHALATION; LEAD; CADMIUM; ZINC; INDUSTRIAL ATMOSPHERES; BIOINDICATORS; NEUROLOGIC MANIFESTATIONS

Roels, H.; Gennart, J.-P.; Lauwerys, R.; Buchet, J.-P.; Malchaire, J.; Bernard, A. 1984 American Journal of Industrial Medicine 7:45-71

Tissue	Cases Exposure Route	Range	Mean	General Information
9534 Blood	1 Ingestion	a) Not applicable b) Not applicable c) Not applicable d) Not applicable e) Not applicable f) Not applicable g) Not applicable	a) 7750 nmol/L b) 5945 nmol/L c) 5395 nmol/L d) 3945 nmol/L e) 4155 nmol/L f) 3015 nmol/L g) 3370 nmol/L	a) 30 hr after 4.5 g HgCl2 b) 48 hr c) 54 hr, after 6 hr hemoperfusion d) 5th d e) 5th d, after hemodialysis f) 14th d g) 14th d, after hemoperfusion and hemodialysis. Previously healthy 35 yr old laboratory employee Kidney disfunction (anuria)

BLOOD; ADULTS; HEMOPERFUSION; HEMODIALYSIS; MERCURY INORGANIC COMPOUNDS; POISONING; DELIBERATE EXPOSURE

Pellinen, T.J.; Karjalainen, K.; Haapanen, E.J. 1983 Journal of Toxicology-Clinical Toxicology 20(2):187-189

Tissue	Cases Exposure Route	Range	Mean	General Information
9535 Blood, plasma		a) Not given b) Not given c) Not given	a) 0.015+/-0.004 ug/mL b) 0.015+/-0.005 ug/mL c) 0.012+/-0.003 ug/mL	a) Insulin-treated diabetics b) Non- insulin-treated diabetics c) Control non-diabetics Collected after overnight fasting. Significant differences between a), c) and b), c). 18-78 yr olds, Oxford, England NA; AAS

BLOOD PLASMA; ENGLAND; DIABETES; METABOLISM; MINERAL METABOLISM; ALUMINUM; ANTIMONY; ARSENIC; BARIUM; BROMINE; CADMIUM; CALCIUM; CESIUM; CHROMIUM; COBALT; COPPER; IODINE; IRON; LEAD; MAGNESIUM; MANGANESE; MERCURY; MOLYBDENUM; NICKEL; RUBIDIUM; SCANDIUM; SELENIUM; SILVER; TIN; VANADIUM; ZINC

Ward, N.I.; Pim, B. 1984 Biological Trace Element Research 6:469-487

Mercury
7439-97-6
Hg
AtW 200.59, MP -38.87 C, BP 356.72 C, VP 2X10(E-3) mm Hg at 25 C, 100 mm Hg at 260 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9586 Blood, whole	72 Inhalation	a) 0.01-0.60 ug b) 0.07-2.42 ug c) 0.01-0.72 ug d) 0.02-1.00 ug e) 0.05-0.80 ug f) 0.11-0.50 ug g) 0.17-0.29 ug h) 0.06-0.46 ug /100 ml	a) 0.30+/-0.17 ug b) 0.49+/-0.57 ug c) 0.38+/-0.19 ug d) 0.30+/-0.22 ug e) 0.23+/-0.22 ug f) 0.28+/-0.16 ug g) 0.25+/-0.05 ug h) 0.22+/-0.14 ug /100 ml	a) Controls, 0 wks, 27 cases b) Controls, 16 wks, 27 cases c) Vitamin C treatment, 0 wks, 25 cases d) Vitamin C treatment, 16 wks, 25 cases e) Controls, 0 wks, 10 cases f) Controls, 8 wks, 10 cases g) Zinc treatment, 0 wks, 10 cases h) Zn treatment, 8 wks, 10 cases Vitamin C dose was 1 g/d, 5 d/wk. Zinc as Zn glutamate dose was 60 mg/d, 5 d/wk. No significant difference between control and treatment groups. 21-64 yr old workers at primary Pb smelter, 0.5-42 years exposure AAS
BLOOD; URINE; OCCUPATIONAL EXPOSURE; ADULTS; LEAD POISONING; METAL POISONING; INDUSTRIAL MEDICINE; CADMIUM; LEAD; MERCURY; ZINC; BIOACCUMULATION; HEALTH HAZARDS; INDUSTRIAL ATMOSPHERES; INDUSTRIAL PLANTS; INHALATION; OCCUPATIONAL HAZARDS; VITAMINS; VITAMIN C Lauwerys, R.; Roels, H.; Buchet, J.-P.; Bernard, A.A.; Verhoeven, L.; Konings, J. 1983 Journal of Occupational Medicine 25(9): 668-678				

Tissue	Cases Exposure Route	Range	Mean	General Information
9587 Breast	22	a) Not given b) Not given	a) 0.87+/-0.45 ug/g b) 0.77+/-0.57 ug/g	a) Normal tissue b) Neoplastic Dry wt, 8 samples, p=0.25 Patients with primary breast carcinoma, samples of normal and neoplastic tissue obtained at time of mastectomy X-ray fluorescence
BREAST; CALCIUM; VANADIUM; CHROMIUM; MANGANESE; IRON; NICKEL; COPPER; ZINC; ARSENIC; SELENIUM; BROMINE; RUBIDIUM; STRONTIUM; MOLYBDENUM; LEAD; MERCURY; NEOPLASMS Rizk, S.L.; Sky-Peck, H.H. 1984 Cancer Research 44:5390-5394				

Tissue	Cases Exposure Route	Range	Mean	General Information
9588 Hair	12 Ingestion	Not given	6.85 ug/g	Area of high fish consumption study done primarily on Se with consideration of its interaction with Hg. Data on ratios of Se:Hg included. Residents of Angmagssalik, East Greenland AAS
BLOOD; HAIR; ENVIRONMENTAL EXPOSURE; DENMARK; GREENLAND; AGE; MERCURY; SELENIUM; DIETS; BIOACCUMULATION Hansen, J.C.; Kromann, N.; Wulf, H.C.; Alboge, K. 1984 Science of the Total Environment 38:35-40				

Mercury
7439-97-6
Hg
AtW 200.59, MP -38.87 C, BP 356.72 C, VP 2X10(E-3) mm Hg at 25 C, 100 mm Hg at 260 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9839 Hair	113	a) Not given b) Not given c) Not given d) Not given e) Not given f) Not given g) Not given h) Not given	a) 4.9+/-3.9 ug/g b) 7.1+/-5.6 ug/g c) 1.8+/-3.1 ug/g d) 1.4+/-2.3 ug/g e) 0.8+/-6.0 ug/g f) 0.4+/-6.4 ug/g g) 2.2+/-1.9 ug/g h) 2.1+/-2.3 ug/g Geometric means	a) Inorganic Hg total in unwashed hair, 51 cases b) In hair pieces, 50 cases c) In needle pads, 4 cases d) In others (undefined), 8 cases e) Organic Hg total in unwashed hair, 51 cases f) In hair pieces, 50 cases g) In needle pads, 4 cases h) In others (undefined), 8 cases In unwashed samples, significant differences between sample types and between dates of cutting (1880-1969). Japanese women. 1981-1983 samples from 22 workers at National Institute of Environmental Studies Atomic emission spectrometry; AAS

HAIR; ENVIRONMENTAL EXPOSURE; JAPAN; COMPARATIVE EVALUATIONS; CALCIUM; COPPER; IRON; LEAD; MAGNESIUM; MANGANESE; MERCURY; MERCURY ORGANIC COMPOUNDS; METALS; MINERALS; PHOSPHORUS; POTASSIUM; SODIUM; STRONTIUM; TRACE ELEMENTS; ZINC; OCCUPATIONAL EXPOSURE
Suzuki, T.; Hongo, T.; Morita, M.; Yamamoto, R. 1984 Science of the Total Environment 39:81-91

Tissue	Cases Exposure Route	Range	Mean	General Information
9840 Hair	a) 40 b) 36 c) 36 Ingestion	a) 5.5-66.2 ppm b) 4.08-32.52 ppm c) 4.32-62.0 ppm	a) 26.29+/-14.51 ppm b) 12.0+/-6.6 ppm c) 15.25+/-11.5 ppm	a) Fishermen b) Mothers c) Neonates Mean fish intake 85-100 kg/person/yr, Republic of Seychelles AAS

SEYCHELLES; ADULTS; NEWBORN; BLOOD; HAIR; MERCURY; METALS; BIOACCUMULATION; DIETS; FISHES; POPULATION EXPOSURE
Matthews, A.D. 1983 Environmental Research 30:305-312

Tissue	Cases Exposure Route	Range	Mean	General Information
9841 Hair	a) 121 b) 122 Ingestion	a) 0.4-14.4 mg/kg b) 0.3-5.2 mg/kg	a) 2.6+/-2.2 mg/kg b) 1.7+/-1.1 mg/kg	a) Coastal residents b) Non-coastal residents Total mercury. Significant correlation with fish consumption for non-coastal residents ($p < 0.05$). 3-75 yr old coastal residents and 3-59 yr old non-coastal residents of Port Moresby, Papua New Guinea

NEW GUINEA; HAIR; MERCURY; MERCURY ORGANIC COMPOUNDS; BIOACCUMULATION; FISHES; FOOD CONTAMINATION; WATER POLLUTION; POPULATION EXPOSURE
Kyle, J. H.; Ghani, N. 1983 Science of the Total Environment 26:157-162

Mercury
7439-97-6
Hg
AtW 200.59, MP -38.87 C, BP 356.72 C, VP 2X10(E-3) mm Hg at 25 C, 100 mm Hg at 260 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9562 Hair	6	a) 4.5-8.0 ug/g b) 6.5-10.5 ug/g c) 2.0-8.0 ug/g d) 12-22 ug/g e) 3.0-21.5 ug/g f) 1.5-5.0 ug/g Estimated from figure	a) 5.9 ug/g b) 8.6 ug/g c) 4.1 ug/g d) 18.0 ug/g e) 12.0 ug/g f) 1.8 ug/g	a) 0-40 cm from scalp, 7 yr old female b) 0-40 cm from scalp, 4 yr old female c) 0-30 cm from scalp, 7 yr old female d) 0-18 cm from scalp, 3 yr old female e) 0-15 cm from scalp, 2 yr old male f) 0-65 cm from scalp, 40 yr old female Range from total length, mean from 1st 10 cm from scalp. Levels not uniform throughout same hair of same person, no definite pattern discernible. Japan NA

HAIR; ENVIRONMENTAL EXPOSURE; JAPAN; ADULTS; CHILDREN; COMPARATIVE EVALUATIONS; BROMINE; CALCIUM; CHLORINE; COPPER; IODINE; MAGNESIUM; MANGANESE; MERCURY; SELENIUM; ZINC; BIOINDICATORS
Yukawa, M.; Suzuki-Yasumoto, M.; Tanaka, S. 1984 Science of the Total Environment 38:41-54

Tissue	Cases Exposure Route	Range	Mean	General Information
9542 Hair	a) 30 b) 18 c) 19 d) 32 e) 10 f) 30	a) 0.8-11.3 ppm b) 0.2-1.5 ppm c) 0.2-13.7 ppm d) 0.9-11.8 ppm e) 0.4-2.0 ppm f) Trace-7.8 ppm	a) 4.1 ppm b) 0.8 ppm c) 2.9 ppm d) 2.6 ppm e) 0.9 ppm f) 1.9 ppm Average of means	a) Males, Japan and USA, 1975 b) Males, Scotland and Switzerland, 1975 c) Males, Indonesia, 1982 d) Females, Japan and USA, 1975 e) Females, Switzerland, 1975 f) Females, Indonesia, 1982 Significant differences between Indonesian males and Swiss and Scottish males ($p<0.01$), and between Indonesian and Swiss females ($p<0.05$). Differences among 5 countries attributed to fish consumption. (a, b, d and e), healthy, mean ages 15.8-36.7 yr; (c and f), no neurological symptoms, mean ages 19.9 and 25.2 yr Mercury vapor meter

HAIR; ENVIRONMENTAL EXPOSURE; INDONESIA; JAPAN; SCOTLAND; SWITZERLAND; UNITED STATES; COMPARATIVE EVALUATIONS; MERCURY; FOOD CONTAMINATION
Ohno, H.; Doi, R.; Tani, Y.; Harada, M. 1984 Bulletin of Environmental Contamination and Toxicology 33:382-385

Tissue	Cases Exposure Route	Range	Mean	General Information
9544 Liver	96	a) <0.02-0.75 mg/kg b) <0.02-1.35 mg/kg	a) 0.27+/-0.21 mg/kg b) 0.25+/-0.22 mg/kg	a) Females b) Males Autopsies. Levels generally lower than those in other countries. No major regional variations. New Zealanders. Death by physical injuries AAS

LIVER; COMPARATIVE EVALUATIONS; ARSENIC; CADMIUM; CHROMIUM; COBALT; COPPER; NEW ZEALAND; AUTOPSIES; LEAD; MANGANESE; MERCURY; NICKEL; SELENIUM; SILVER; ZINC
Pickston, L.; Lewin, J.P.; Drysdale, J.M.; Smith, J.M.; Bruce, J. 1983 Journal of Analytical Toxicology 7:2-6

Mercury
7439-97-6
Hg
AtW 200.59, MP -38.87 C, BP 356.72 C, VP 2X10(E-3) mm Hg at 25 C, 100 mm Hg at 260 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9545 Milk				Review. Levels after occupational exposures to trace metals, solvents, and halogenated hydrocarbons, discussed in terms of milk partition factors, potential infant exposures, possible health effects.

MILK; ENVIRONMENTAL EXPOSURE; ADULTS; REVIEW; MERCURY; LEAD; DDT; DIELDRIN; POLYCHLORINATED BIPHENYLS; POLYBROMINATED BIPHENYLS; CHROMIUM; CADMIUM; HEPTACHLOR EPOXIDE; OXYCHLORDANE; BIOACCUMULATION; LACTATION; HEALTH HAZARDS
Wolff, M.S. 1983 American Journal of Industrial Medicine 4:259-281

Tissue	Cases Exposure Route	Range	Mean	General Information
9546 Milk				Review. Chemicals found in occupational exposures are discussed in terms of milk partition factors, potential infant exposures and possible infant health effects.

LEAD; MERCURY; PESTICIDES; POLYCHLORINATED BIPHENYLS; OCCUPATIONAL HAZARDS; MILK; COMPARATIVE EVALUATIONS; REVIEW; CADMIUM; CHROMIUM; DDT; DIELDRIN; INFANTS
Wolff, M.S. 1983 American Journal of Industrial Medicine 4:259-281

Tissue	Cases Exposure Route	Range	Mean	General Information
9547 Milk	a) 12 b) 17 c) 6	a) 6.9-27.0 ug/kg b) 1.2-37.4 ug/kg c) 1.7-18.4 ug/kg Dry wt	a) 15.4+/-6.6 ug/kg b) 9.3+/-8.7 ug/kg c) 7.6+/-6.9 ug/kg Dry wt	a) Colostrum (1st or 2nd day post partum) b) Transitional milk (3-8 days post partum) c) Mature milk (1-8 mo post partum) Slovenia, Yugoslavia NA

MILK; ARSENIC; CADMIUM; COBALT; COPPER; MERCURY; IODINE; MANGANESE; ANTIMONY; SELENIUM; VANADIUM; ZINC; YUGOSLAVIA; ENVIRONMENTAL EXPOSURE
Kosta, L.; Byrne, A.R.; Dermelj, M. 1983 Science of the Total Environment 29:261-268

Tissue	Cases Exposure Route	Range	Mean	General Information
9548 Omentum	1	Not given	5.4 mg/kg	After peritoneal irrigation with 0.2% Hg-chloride during surgery 64 yr old carcinoma patient, hemicolectomy Abdominal pain, nausea, metallic taste, hypotension, wound disruption, renal failure Proteinuria, oliguria, exudative peritonitis Chem

OMENTUM; CASE HISTORIES; AUSTRALIA; MERCURY; ADULTS; BLOOD SERUM; HEMODIALYSIS; SURGERY; DELIBERATE EXPOSURE; DRUGS; DRUG THERAPY
Lai, K-N.; Pugsley, D.J.; Black, R.B. 1983 Medical Journal of Australia 1:37-38

Mercury
7439-97-6
Hg
AtW 200.59, MP -38.87 C, BP 356.72 C, VP 2X10(E-3) mm Hg at 25 C, 100 mm Hg at 260 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9549 Placenta	251	2-3166 ng/g Wet wt	185+/-452 ng/g Wet wt	210 cases Nagoya, Japan, 1974-1976. Normal deliveries. AAS
ZINC; MERCURY; METHYLMERCURY; LEAD; CADMIUM; MANGANESE; COPPER; IRON; JAPAN; BLOOD; PLACENTA; UMBILICAL CORD; METALS; ENVIRONMENTAL EXPOSURE Tsuchiya, H.; Mitani, K.; Kodama, K.; Nakata, T. 1984 Archives of Environmental Health 39(1);11-17				

Tissue	Cases Exposure Route	Range	Mean	General Information
9550 Placenta				Review. Discussion of relationship to specificity of fetal effects, follow-up, possible mechanisms of toxicity. Specimens from U.S., Belgium, Japan
PLACENTA; ALABAMA; BELGIUM; CALIFORNIA; GEORGIA; GERMANY; IOWA; JAPAN; MISSOURI; NEW JERSEY; NEW YORK; NORTH CAROLINA; OHIO; TENNESSEE; TEXAS; UNITED KINGDOM; UTAH; CADMIUM; COPPER; LEAD; MERCURY; MERCURY INORGANIC COMPOUNDS; MERCURY ORGANIC COMPOUNDS; ZINC; PREGNANCY; BEHAVIOR DISORDERS Miller, R.K. 1984 American Journal of Industrial Medicine 4:205-244				

Tissue	Cases Exposure Route	Range	Mean	General Information
9551 Umbilical cord	251	1-850 ng/g Wet wt	47+/-108 ng/g Wet wt	215 cases Nagoya, Japan, 1974-1976. Normal deliveries. AAS
ZINC; MERCURY; METHYLMERCURY; LEAD; CADMIUM; MANGANESE; COPPER; IRON; JAPAN; BLOOD; PLACENTA; UMBILICAL CORD; METALS; ENVIRONMENTAL EXPOSURE Tsuchiya, H.; Mitani, K.; Kodama, K.; Nakata, T. 1984 Archives of Environmental Health 39(1);11-17				

Mercury

7439-97-6

Hg

AtW 200.59, MP -38.87 C, BP 356.72 C, VP 2X10(E-3) mm Hg at 25 C, 100 mm Hg at 260 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9552 Urine	192	a) 0.4-28.7 ug b) 0.5-28.1 ug c) 0.4-28.7 ug d) 1.4-274.8 ug e) 4.8-262.8 ug f) 0.5-216.4 ug /g creatinine	a) 4.6 ug b) 4.1 ug c) 3.3 ug d) 70.9 ug e) 68.1 ug f) 62.8 ug /g creatinine	a) Controls, 87 cases b) 1 mo later, 80 cases c) 2 mo later, 83 cases d) Mercury exposed, 105 cases e) 1 mo later, 94 cases f) 2 mo later, 99 cases Exposure over mean of 8.0 yr (range 1-33 yr). Both groups, no exposure to Cd or Pb in previous 5 yr. Controls, levels <16 ug/l before study. Significant correlation between blood and urine concentrations 16.5-61.3 yr old (mean age 38.2) mercury exposed chlor-alkali plant workers and 20.0-61.3 yr old (mean age 41.4) chemical plant workers (controls), United Kingdom Urinary protein lower and enzyme activities unchanged compared to control. Suspected cause is release of proteases from damaged tubular cells UV
BLOOD; URINE; OCCUPATIONAL EXPOSURE; UNITED KINGDOM; ADULTS; MERCURY; METALS Stonard, M.D.; Chater, B.V.; Duffield, D.P.; Nevitt, A.L.; O'Sullivan, J.J.; Steel, G.T. 1983 International Archives of Occupational and Environmental Health 52:177-189				

Tissue	Cases Exposure Route	Range	Mean	General Information
9553 Urine	a) 25 b) 22	a) Not applicable b) 8.2-266 ug /g creatinine	a) <5 ug b) 117 ug /g creatinine	a) Controls b) Exposed 4 yr to vapor. No increase in structural chromosome aberrations Male workers (mean age 41.5 yr) at Hg amalgamation and chloralkali plant. Half were smokers. Controls, mean age 40.1 yr. AAS
URINE; BLOOD; OCCUPATIONAL EXPOSURE; ADULTS; COMPARATIVE EVALUATIONS; MERCURY; INDUSTRIAL ATMOSPHERES; CHROMOSOMAL ABERRATIONS Mabille, V.; Roels, H.; Jacquet, P.; Leonard, A.; Lauwerys, R. 1984 International Archives of Occupational and Environmental Health 55:257-260				

Tissue	Cases Exposure Route	Range	Mean	General Information
9554 Urine	A) 10 b) 10 c) 10 Inhalation	a) Not given b) Not given c) Not given	a) 160+/-7.0 nmol/24 hr b) 218+/-92 nmol/24 hr c) 249+/-136 nmol/24 hr	a) Unexposed b) Exposed on day of study c) Exposed only before study Renal clearance of inorganic in ml/min was 0.89+/-0.55, 2.80+/-1.82, 4.83+/-136 respectively. Workers, 34.8+/-8.9 yr old (21-53). Controls 39.8+/-12.4 yr old. Mean exposure time 9.4+/-4.4 yr (1-12). All clinically healthy AAS
MERCURY; METALS; BLOOD; URINE; OCCUPATIONAL EXPOSURE; AIR POLLUTION; OCCUPATIONAL HAZARDS; DIURNAL VARIATIONS; ENZYMES Aitio, A.; Valkonen, S.; Kivisto, H.; Yrjanheikki, E. 1985 International Archives of Occupational and Environmental Health 55:139-147				

Mercury
7439-97-6
Hg
AtW 200.59, MP -38.87 C, BP 356.72 C, VP 2X10(E-3) mm Hg at 25 C, 100 mm Hg at 260 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9555 Urine	a) 114 b) 131 c) 48 d) 84	a) 0.1-4.9 ug b) 7.3-272.1 ug c) 0.1-4.9 ug d) 7.3-89.4 ug /g creatinine	a) 0.9+/-0.88 ug b) 51.5+/-43.5 ug c) 1.7+/-1.53 ug d) 36.5+/-15.7 ug /g creatinine	a) Unexposed male factory workers b) Exposed male workers c) Unexposed female factory workers d) Exposed female workers Exposed to Hg vapor. Male and female factory workers, ages 30.9 and 29.9 yr, exposure durations 4.8 and 7 yr. Matched controls. Belgium Memory disturbances, depression, fatigue, irritability, tremors Renal tubular effects: increased urinary Beta-galactosidase activity, excretion of retinol-binding protein AAS
MERCURY; BLOOD; URINE; OCCUPATIONAL EXPOSURE; SEX; BELGIUM; HEALTH HAZARDS; OCCUPATIONAL HAZARDS; INHALATION; LEAD; CADMIUM; ZINC; INDUSTRIAL ATMOSPHERES; BIOINDICATORS; NEUROLOGIC MANIFESTATIONS Roels, H.; Gennart, J.-P.; Lauwerys, R.; Buchet, J.-P.; Malchaire, J.; Bernard, A. 1984 American Journal of Industrial Medicine 7:45-71				

Tissue	Cases Exposure Route	Range	Mean	General Information
9556 Urine	1 Ingestion	a) Not given b) Not given c) Not given d) Not given e) Not given f) Not given g) Not given h) Not given i) Not given j) Not given k) Not given	a) 68.9 mg/l b) 10.9 mg/l c) 2.7 mg/l d) 1.6 mg/l e) 0.82 mg/l f) 0.67 mg/l g) 0.74 mg/l h) 0.24 mg/l i) 0.105 mg/l j) 0.10 mg/l k) 0.087 mg/l	a) 1 day b) 2 days c) 3 days d) 4 days e) 5 days f) 6 days g) 7 days h) 8 days i) 18 days j) 32 days k) 62 days Times after ingestion of unknown quantity as chloride. Dimercaprol given days 1-4. 23 mo old Edema and ulceration of tongue and lips, mild renal function impairment Peak blood urea on day 4 (14 mmol/l), peak serum creatimine on day 6 (114 umol/l)
DELIBERATE EXPOSURE; UNITED KINGDOM; CASE HISTORIES; CHILDREN; METAL POISONING; BLOOD; URINE; MERCURY INORGANIC COMPOUNDS; ACCIDENTAL POISONING Stack, T.; Bissenden, J.G.; Hoffman, G.; Yeoman, W.B. 1983 British Medical Journal 287:1513				

Mercury
7439-97-6
Hg
AtW 200.59, MP -38.87 C, BP 356.72 C, VP 2X10(E-3) mm Hg at 25 C, 100 mm Hg at 266 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9557 Urine	72 Inhalation	a) 0.4-1.8 ug b) 0.4-6.2 ug c) 0.3-2.6 ug d) 0.5-2.0 ug e) 0.3-1.4 ug f) 0.4-5.9 ug g) 0.3-0.9 ug h) 0.3-1.1 ug /g creatinine	a) 0.8+/-0.39 ug b) 1.3+/-1.18 ug c) 1.0+/-0.57 ug d) 1.0+/-0.46 ug e) 0.7+/-0.36 ug f) 1.3+/-1.66 ug g) 0.6+/-0.20 ug h) 0.6+/-0.27 ug /g creatinine	a) Controls, 0 wks, 27 cases b) Controls, 16 wks, 27 cases c) Vitamin C treatment, 0 wks, 25 cases d) Vitamin C treatment, 16 wks, 25 cases e) Controls, 0 wks, 10 cases f) Controls, 8 wks, 10 cases g) Zinc treatment, 0 wks, 10 cases h) Zn treatment, 8 wks, 10 cases Vitamin C dose was 1 g/d, 5 d/wk. Zinc as Zn glutamate dose was 60 mg/d, 5 d/wk. No significant difference between control and treatment groups. 21-64 yr old workers at primary Pb smelter, 0.5-42 years exposure AAS
BLOOD; URINE; OCCUPATIONAL EXPOSURE; ADULTS; LEAD POISONING; METAL POISONING; INDUSTRIAL MEDICINE; CADMIUM; LEAD; MERCURY; ZINC; BIOACCUMULATION; HEALTH HAZARDS; INDUSTRIAL ATMOSPHERES; INDUSTRIAL PLANTS; INHALATION; OCCUPATIONAL HAZARDS; VITAMINS; VITAMIN C Lauwerys, R.; Roels, H.; Buchet, J.-P.; Bernard, A.A.; Verhoeven, L.; Konings, J. 1983 Journal of Occupational Medicine 25(9): 668-676				

Tissue	Cases Exposure Route	Range	Mean	General Information
9558 Urine	1	98.75-7.5 ug/L	Not given	Over 3-4 months, several months after 2 days salvaging Hg from thermometers. 54 yr old Syndrome closely resembling amyotrophic lateral sclerosis Fasciculations, wt loss, unsteady writing, tingling, numbness of hands and feet. Deep tendon reflexes slightly abnormal. Electromyography showed increased irritability
URINE; OCCUPATIONAL EXPOSURE; CASE HISTORIES; METAL POISONING; NEUROLOGIC MANIFESTATIONS; MERCURY; ACCIDENTAL POISONING; INDUSTRIAL PLANTS; OCCUPATIONAL HAZARDS Adams, C.R.; Ziegler, D.K.; Lin, J.T. 1983 Journal of the American Medical Association 250(5):642-643				

Mercury(1+), methyl-, ion (8 CI); Mercury(1+), methyl- (9 CI)
22967-92-6
C-H3-Hg
MW 215.63

Tissue	Cases Exposure Route	Range	Mean	General Information
9559 Blood	231	a) 1-29 ppb b) 1-735 ppb	a) 9+/-5 ppb b) 144+/-9 ppb	a) Maternal, 226 cases b) Cord, 226 cases Significant positive correlation. Determinations over 5-yr period. Nagoya, Japan, 1974-1978. Maternal venous and umbilical cord blood, normal deliveries. AAS
ZINC; MERCURY; METHYLMERCURY; LEAD; CADMIUM; MANGANESE; COPPER; IRON; JAPAN; BLOOD; PLACENTA; UMBILICAL CORD; METALS; ENVIRONMENTAL EXPOSURE Tsuchiya, H.; Mitani, K.; Kodama, K.; Nakata, T. 1984 Archives of Environmental Health 39(1):11-17				

Mercury(1+), methyl-, ion (8 CI); Mercury(1+), methyl- (9 CI)
22967-92-6
C-H3-Hg
MW 215.63

Tissue	Cases Exposure Route	Range	Mean	General Information
9560 Hair	230 Ingestion	a) Not given b) Not given c) Not given d) Not given e) Not given f) Not given g) Not given h) Not given	a) 20.1+/-6.1 ug/g b) 24.5+/-8.9 ug/g c) 28.6+/-13.6 ug/g d) 14.7+/-4.7 ug/g e) 15.9+/-8.1 ug/g f) 16.7+/-7.9 ug/g g) 10.5+/-10.6 ug/g h) 10.1+/-5.4 ug/g	a) 17 Mistassini men, 15.7 ug/g in 62 controls b) 11 Mistassini women, 15.3 ug/g in 95 controls c) 10 Great Whale men, 15.3 ug/g in 6 controls d) 8 Great Whale women, 17.9 ug/g in 16 controls e) 17 Mistassini men, 10.7 ug/g in 62 controls f) 11 Mistassini women, 10.3 ug/g in 95 controls g) 10 Great Whale men, 5.6 ug/g in 6 controls h) 8 Great Whale women, 9.3 ug/g in 16 controls a-d) 1975-1976, e-h) 1975. All subjects, except controls, had measured neurological abnormalities. Adult Cree Indians, northern Quebec, exposed to methyl-Hg through contaminated fish Nystagmus, tremor, poor coordination, poor visual discrimination AAS

HAIR; ENVIRONMENTAL EXPOSURE; CANADA; ADULTS; NEUROLOGIC MANIFESTATIONS; COMPARATIVE EVALUATIONS; METHYL MERCURY COMPOUNDS; FOOD CONTAMINATION
McKeown-Eyssen, G.E.; Ruedy, J. 1983 American Journal of Epidemiology 118(4):461-469

Tissue	Cases Exposure Route	Range	Mean	General Information
9561 Placenta	231	1-47 ppb	14+/-8 ppb	226 cases Nagoya, Japan, 1974-1976. Normal deliveries. AAS
9562 Umbilical cord	231	1-28 ppb	8+/-5 ppb	215 cases Nagoya, Japan. 1974-1976. Normal deliveries. AAS

ZINC; MERCURY; METHYLMERCURY; LEAD; CADMIUM; MANGANESE; COPPER; IRON; JAPAN; BLOOD; PLACENTA; UMBILICAL CORD; METALS; ENVIRONMENTAL EXPOSURE
Tsuchiya, H.; Mitani, K.; Kodama, K.; Nakata, T. 1984 Archives of Environmental Health 39(1):11-17

Mercury, chloroethyl-
107-27-7
C2-H5-Cl-Hg
MW 265.13, MP 192 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9565 Urine	40 Ingestion	a) 0-0.06 mg/l b) 0.008-0.16 mg/l c) 0.008-0.06 mg/l d) 0.01-0.26 mg/l e) 0.08-0.26 mg/l f) 0.29-0.33 mg/l	a) 0.026 mg/l b) 0.069 mg/l c) 0.030 mg/l d) 0.095 mg/l e) 0.165 mg/l f) 0.310 mg/l	a) Mild poisoning intake of 0.5-1 mg/kg body wt b) Moderate, 1.0-2.0 mg/kg c) Severe 2.0-3.0 mg/kg d) Mild cases during chelation treatment e) Moderate during treatment f) Severe during treatment Ate disinfected, cooked seed rice with 48-80 mg Hg/kg. In one case 4.0 mg/kg body wt was lethal. All cases improved after chelation therapy. Guandong Province China, 2-65 yr olds, farm families Dizziness, insomnia, nausea, weakness, emaciation, loss of appetite, diarrhea, unconsciousness Gingivitus, gingiva pigmentated & hypertrophied, systolic murmurs, hepatomegaly, peripheral muritis, pathological reflexes, ECG abnormalities, tetraplegia, hypokalemia
ACCIDENTAL POISONING; ENVIRONMENTAL EXPOSURE; CHINA; FOOD CONTAMINATION; NEUROLOGIC MANIFESTATIONS; CHELATING AGENTS; URINE; METAL POISONING; MERCURY ORGANIC COMPOUNDS; CHLORINE COMPOUNDS; HEALTH HAZARDS Zhang, J. 1984 American Journal of Industrial Medicine 5:251:258				

Methane, bromodichloro-
75-27-4
C-H-Br-Cl2
MW 163.83, MP -57.1 C, BP 90 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9564 Breath	a) 9 b) 8	a) 0.17-0.20 ug/cu m b) 0.14-2.20 ug/cu m	a) 0.17 ug/cu m b) Not given Median	a) Bayonne and Elisabeth, NJ. 4 chemical and oil workers, 4 persons with no occupational exposure, 1 sewage plant operator b) Research Triangle Park, NC subjects with no occupational exposure. Transmitted primarily through beverages and water, food relatively unimportant exposure route. Adult volunteers GC-MS
BREATH; ENVIRONMENTAL EXPOSURE; OCCUPATIONAL EXPOSURE; NEW JERSEY; NORTH CAROLINA; CHLORINATED HYDROCARBONS; CHLORINE ORGANIC COMPOUNDS; VOLATILE ORGANIC COMPOUNDS; BIOLOGICAL MONITORING; DRINKING WATER; FOODS Wallace, L.A.; Pellizzari, E.; Hartwell, T.; Rosenzweig, M.; Erickson, M.; Sparacino, C.; Zelon, H. 1984 Environmental Research 35:293-319				

Methanol

67-56-1
C-H4-O
MW 32.04, MP -97.8 C, BP 64.7 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9565 Blood	1 Ingestion	a) Not given b) Not given c) Not given	a) 3.3 mmol/l b) 0.34 mmol/l c) 0.2 mmol/l	a) After 1st hemodialysis b) After 2nd hemodialysis at 15 hr c) After 3rd hemodialysis, 16 hr after b) Drank 100 ml, 98% purity, initial level estimated 50 mmol/l. 53 yr old woman Photophobia at 12 hr GC
ALCOHOLS; BLOOD; ACCIDENTAL POISONING; UNITED KINGDOM; DELIBERATE EXPOSURE; HEMODIALYSIS; DRUGS Saus, J.; Sanchis, R.; Siguenza, P.; Rubio, V. 1984 Lancet 1(8369):158				

Tissue	Cases Exposure Route	Range	Mean	General Information
9566 Blood	1	Not given	220 mg/dl	After methanol poisoning. Serum lactate, 7.2 mmol/l. Anion gap (Na+ + K+) - (Cl- + COOH-), 45 mmol/l. 32 yr old Vomiting, epigastric pain, blurred vision for 24 hr prior to hospital admission. At admission, coma completely areflexic with bilateral mydriasis and acidotic respiration, temperature 35.7 C, systolic blood pressure 80 mm Hg, Death 72 hr later.
ACCIDENTAL POISONING; BELGIUM; ADULTS; CASE HISTORIES; BLOOD; BLOOD SERUM; FORENSIC MEDICINE; ALCOHOLS Cytryn, E.; Futeral, B. 1983 Lancet 1(8340):56				

Tissue	Cases Exposure Route	Range	Mean	General Information
9567 Blood, serum	1 Ingestion	0-1.13 g/l	Not given	6 and approximately 30 hr after drinking 500 ml antifreeze, peak at 6 hr. Successful therapy was: ethanol, hemodialysis, gastric lavage. Toxic level considered 0.2 g/l. 36 yr old man Drowsiness, hyperventilation Respiratory alkalosis and metabolic acidosis
BLOOD SERUM; DELIBERATE EXPOSURE; UNITED KINGDOM; CASE HISTORIES; HEMODIALYSIS; LAVAGE; METHANOL; ALCOHOLS; ANTIFREEZE Vites, N.P.; Payne, C.R.; Gokal, R. 1984 Lancet 1(8376):562				

Methanol

67-56-1
C-H4-O
MW 32.04, MP -97.8 C, BP 64.7 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9568 Blood, serum	1 Ingestion	a) Not given b) 2.8-3.4 mmol/L	a) 9.7 mmol/L b) Not given	a) 8 hr after ingestion b) 21-32 hr Baby given amoxicillin accidently suspended in methanol/water(70/30 by vol) 8 mo old, Salt Lake City, UT No optical neuropathy GC
BLOOD SERUM; DELIBERATE EXPOSURE; UTAH; INFANTS; METHANOL; ACCIDENTAL POISONING Shahangian, S.; Robinson, V.L.; Jennison, T.A. 1984 Clinical Chemistry 30(8):1413-1414				

Molybdenum

7439-98-7
Mo
AtW 95.94, MP 2622 C, BP 4825 C (approx), VP 1 mm Hg at 3300 C, 10 mm Hg at 3770 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9569 Blood, plasma		a) Not given b) Not given c) Not given	a) 0.0026+/-0.0004 ug/mL b) 0.00275+/-0.0007 ug/mL c) 0.0024+/-0.0004 ug/mL	a) Insulin-treated diabetics b) Non-insulin-treated diabetics c) Control non-diabetics Collected after overnight fasting. Significant difference between b) and c). 18-78 yr olds, Oxford, England NA; AAS
BLOOD PLASMA; ENGLAND; DIABETES; METABOLISM; MINERAL METABOLISM; ALUMINUM; ANTIMONY; ARSENIC; BARIUM; BROMINE; CADMIUM; CALCIUM; CESIUM; CHROMIUM; COBALT; COPPER; IODINE; IRON; LEAD; MAGNESIUM; MANGANESE; MERCURY; MOLYBDENUM; NICKEL; RUBIDIUM; SCANDIUM; SELENIUM; SILVER; TIN; VANADIUM; ZINC Ward, N.I.; Pim, B. 1984 Biological Trace Element Research 6:469-487				

Tissue	Cases Exposure Route	Range	Mean	General Information
9570 Breast	22	a) Not given b) Not given	a) 2.70+/-0.95 ug/g b) 2.45+/-0.67 ug/g	a) Normal tissue b) Neoplastic Dry wt, 3 samples, p=0.15 Patients with primary breast carcinoma, samples of normal and neoplastic tissue obtained at time of mastectomy X-ray fluorescence
BREAST; CALCIUM; VANADIUM; CHROMIUM; MANGANESE; IRON; NICKEL; COPPER; ZINC; ARSENIC; SELENIUM; BROMINE; RUBIDIUM; STRONTIUM; MOLYBDENUM; LEAD; MERCURY; NEOPLASMS Risk, S.L.; Sky-Peck, H.H. 1984 Cancer Research 44:5390-5394				

Molybdenum

7439-98-7
Mo
AtW 95.94, MP 2622 C, BP 4825 C (approx), VP 1 mm Hg at 3500 C, 10 mm Hg at 3770 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9571 Breast fluid	Ingestion	a) Not given b) Not given c) Not given d) Not given	a) 12.1+/-5.5 ug/g b) 10.8+/-5.5 ug/g c) 10.7+/-3.4 ug/g d) 7.2+/-5.4 ug/g	a) Middle income, 3-5 days post partum, 6 cases b) Low income, 3-5 days post partum, 9 cases c) Middle income, 4-6 wks post partum, 8 cases d) Low income, 4-6 wks post partum, 8 cases Differences not statistically significant Mothers in Hyderabad, India NA
MILK; INDIA; ADULTS; COPPER; MANGANESE; MOLYBDENUM; ZINC; DIETS; LACTATION; NEWBORN; NUTRITIONAL DEFICIENCIES Dang, H.S.; Jaiswal, D.D.; Somasundaram, S.; Deshpande, A.; Dacosta, H. 1984 Science of the Total Environment 35: 85-89				

Neodymium

7440-00-8
Nd
AtW 144.24, MP approx 1024 C (also reported as 1021 C), BP approx 3000 C (also reported as 3068 C), VP 400 mm Hg at 2870 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9572 Lung	a) 1 b) 6 Inhalation	a) Not given b) Not given	a) 57,750 ppb b) 46.2 ppb	a) Exposed worker, biopsy b) Unexposed controls, autopsies 58 yr old photoengraver, exposed to smoke from carbon arc lamp during 46 yr. 20-83 yr old controls. Italy Worker: dyspnea, cough, cyanosis (extremities), crepitant rales, pulmonary fibrosis, hypertension, cardiac hypertrophy and overloading, death from acute cardiorespiratory insufficiency NA
9573 Lymph node	a) 1 b) 7 Inhalation	a) Not given b) Not given	a) 2,375 ppb b) 118 ppb	a) Exposed worker, biopsy b) Unexposed controls, autopsies 58 yr old photoengraver, exposed to smoke from carbon arc lamp during 46 yr. 20-83 yr old controls. Italy Worker: dyspnea, cough, cyanosis, (extremities), crepitant rales, pulmonary fibrosis hypertension, cardiac hypertrophy and overloading, death from acute cardiorespiratory insufficiency NA
NEODYMIUM; YTTERBIUM; TERBIUM; EUROPIUM; LUTETIUM; ITALY; ADULTS; AUTOPSIES; CASE HISTORIES; PNEUMOCONIOSIS; LUNGS; LYMPH NODES; BIOPSIES; CERIUM; LANTHANUM; METALS; SAMARIUM; THORIUM; DUST; FUMES; INHALATION; OCCUPATIONAL HAZARDS; PRINTING INDUSTRY; OCCUPATIONAL EXPOSURE Vocaturo, G.; Colombo, F.; Zanoni, M.; Rodi, F.; Sabbioni, E.; Pietra, R. 1978 Chest 83(5):780-783				

Nickel
7440-02-0
Ni
AtW 58.71, MP 1455 C, BP 2837 C, VP 10 mm Hg at 2090 C, 100 mm Hg at 2370 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9574 Aorta	a) 3 b) 6 c) 7	a) 0.0-6.4 ppm b) 0.41-2.1 ppm c) Not given Dry wt	a) Not given b) Not given c) 0.50+/-0.20 ppm Dry wt	a) Sclerotic aorta from metal-workers b) Normal aorta from metal-workers c) Normal aorta from non metal-workers 45-66 yr old workers. Autopsies, Japan, 1976-1977. Employed 7-32 yr ES
AORTA; VERTEBRAE; BONES; ENVIRONMENTAL EXPOSURE; OCCUPATIONAL EXPOSURE; JAPAN; AUTOPSIES; CADAVERS; CARDIOVASCULAR DISEASES; MINERALS; BIOACCUMULATION; DIETS; FOODS; MINERAL DEPOSITS; CALCIUM; PHOSPHORUS; IRON; MAGNESIUM; ZINC; ALUMINUM; COPPER; CADMIUM; LEAD; NICKEL; VANADIUM; CHROMIUM; MANGANESE; SILICON; TIN; TITANIUM; STRONTIUM Terasoka, H. 1984 Archives of Environmental Contamination and Toxicology 13:119-127				

Tissue	Cases Exposure Route	Range	Mean	General Information
9575 Blood, plasma		a) Not given b) Not given c) Not given	a) 0.017+/-0.002 ug/mL b) 0.016+/-0.007 ug/mL c) 0.017+/-0.003 ug/mL	a) Insulin-treated diabetics b) Non-insulin-treated diabetics c) Control non-diabetics Collected after overnight fasting. Differences not significant. 18-78 yr olds, Oxford, England NA; AAS
BLOOD PLASMA; ENGLAND; DIABETES; METABOLISM; MINERAL METABOLISM; ALUMINUM; ANTIMONY; ARSENIC; BARIUM; BROMINE; CADMIUM; CALCIUM; CESIUM; CHROMIUM; COBALT; COPPER; IODINE; IRON; LEAD; MAGNESIUM; MANGANESE; MERCURY; MOLYBDENUM; NICKEL; RUBIDIUM; SCANDIUM; SELENIUM; SILVER; TIN; VANADIUM; ZINC Ward, N.I.; Pim, B. 1984 Biological Trace Element Research 6:469-487				

Tissue	Cases Exposure Route	Range	Mean	General Information
9576 Blood, serum	150	a) Not given b) Not given c) 2.3+/-0.2-2.8+/-0.2 ug/L d) Not given S.E.	a) 2.5+/-0.2 ug/L b) 4.5+/-0.3 ug/L c) Not given d) 2.2 ug/L S.E.	a) 20 controls b) 20 patients with myocardial infarction c) 66 others, range of means d) 56 patients with infarctions, 21-30 hr after last chest pains Significant differences between a) and b), d) and initial levels. d) estimated from graph Controls from 30-56 yr olds, 24% with family history of ischemia. 53 yr olds with infarctions, 46 males, 8 females, 64% smokers, 32% family history of ischemia. Others - different diseases, hypertension Colorimetry
BLOOD SERUM; HEART DISEASES; HYPERTENSION; TRACE ELEMENTS; COPPER; ZINC; IRON; NICKEL; COBALT; SODIUM; POTASSIUM; CALCIUM; MAGNESIUM; PAKISTAN; COMPARATIVE EVALUATIONS; CHOLESTEROLS Khan, S.N.; Rahman, M.A.; Samad, A. 1984 Clinical Chemistry 30(5):644-648				

Nickel
7440-02-0
Ni
AtW 58.71, MP 1455 C, BP 2837 C, VP 10 mm Hg at 2090 C, 100 mm Hg at 2370 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9577 Blood, whole	13 Inhalation	a) 0.01-0.05 umol/l b) Not given c) Not given d) Not given	a) 0.02 umol/l b) 0.018 umol/l c) 0.016 umol/l d) 0.020 umol/l	a) Welders, 10 cases, daily mean b) Controls, 3 cases c) Welders, before shift d) Welders, after shift Concentration of Cr and Ni in air correlated with urine levels and with retention of magnetic dust in lungs. Healthy stainless steel welders, 39+/-6 yr. Employed 13+/-6 yr. Controls in same factory but not exposed to fumes. AAS

BLOOD PLASMA; BLOOD; URINE; OCCUPATIONAL EXPOSURE; ADULTS; CHROMIUM; NICKEL; METALS; BIOLOGICAL MONITORING; INDUSTRIAL ATMOSPHERES; INHALATION
Rahkonen, E.; Junttila, M.-L.; Kalliomaki, L.; Olkinuora, M.; Koponen, M.; Kalliomaki, K. 1983 International Archives of Occupational and Environmental Health 52:243-255

Tissue	Cases Exposure Route	Range	Mean	General Information
9578 Breast	22	a) Not given b) Not given	a) 0.96+/-0.47 ug/g b) 1.27+/-0.59 ug/g	a) Normal tissue b) Neoplastic Dry wt, 3 samples, p=0.04 Patients with primary breast carcinoma, samples of normal and neoplastic tissue obtained at time of mastectomy X-ray fluorescence

BREAST; CALCIUM; VANADIUM; CHROMIUM; MANGANESE; IRON; NICKEL; COPPER; ZINC; ARSENIC; SELENIUM; BROMINE; RUBIDIUM; STRONTIUM; MOLYBDENUM; LEAD; MERCURY; NEOPLASMS
Rizk, S.L.; Sky-Peck, H.H. 1984 Cancer Research 44:5390-5394

Tissue	Cases Exposure Route	Range	Mean	General Information
9579 Liver	96	a) <0.01-0.13 mg/kg b) <0.01-0.10 mg/kg	a) 0.06 +or- 0.03 mg/kg b) 0.07 +or- 0.05 mg/kg	a) Females b) Males Autopsies. Levels generally lower than those in other other countries. No major regional variations. New Zealanders. Death by physical injuries AAS

LIVER; COMPARATIVE EVALUATIONS; ARSENIC; CADMIUM; CHROMIUM; COBALT; COPPER; NEW ZEALAND; AUTOPSIES; LEAD; MANGANESE; MERCURY; NICKEL; SELENIUM; SILVER; ZINC
Pickston, L.; Lewin, J.F.; Drysdale, J.M.; Smith, J.M.; Bruce, J. 1983 Journal of Analytical Toxicology 7:2-6

Nickel

7440-02-0
Ni
AtW 58.71, MP 1455 C, BP 2837 C, VP 10 mm Hg at 2060 C, 100 mm Hg at 2370 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9580 Urine	18 Inhalation	a) 8-47 ug/g creatinine b) 10-54 ug/g creatinine c) 4-11 ug/g creatinine	a) 16 ug/g creatinine b) 26 ug/g creatinine c) 6 ug/g creatinine	a) Wk 1-3 after 3 wk holiday b) Wk 4-12 c) Nonexposed controls, wk 4-12 32 ug/cu m in workplace air. No significant differences between smokers/nonsmokers. 28-60 yr old battery factory workers, Sweden. 2-20 yr employment. 22-48 yr old controls. ETA
SWEDEN; ADULTS; KIDNEY DISEASES; METAL POISONING; URINE; COMPARATIVE EVALUATIONS; NICKEL; INDUSTRIAL ATMOSPHERES; OCCUPATIONAL EXPOSURE Hassler, E.; Lind, B.; Nilsson, B.; Piscator, M. 1983 Annals of Clinical and Laboratory Science 13(3):217-224				

Tissue	Cases Exposure Route	Range	Mean	General Information
9581 Urine	8 Inhalation	a) 7.8-26.5 ug b) Not given c) Not given d) Not given /g creatinine	a) 11.5 ug b) 5.2 ug c) 12.0 ug d) 12.5 ug /g creatinine	a) Welders, 10 cases, daily mean b) Controls, 3 cases c) Welders, before shift d) Welders, after shift Concentration of Cr and Ni in air correlated with urine levels and with retention of magnetic dust in lungs. Healthy stainless steel welders, 39+/-6 yr. Employed 13+/-6 yr. Controls in same factory but not exposed to fumes. AAS
BLOOD PLASMA; BLOOD; URINE; OCCUPATIONAL EXPOSURE; ADULTS; CHROMIUM; NICKEL; METALS; BIOLOGICAL MONITORING; INDUSTRIAL ATMOSPHERES; INHALATION Rahkonen, E.; Junttila, M.-L.; Kalliomaki, L.; Olkinuora, M.; Koponen, M.; Kalliomaki, K. 1983 International Archives of Occupational and Environmental Health 52:243-255				

Nitrate

14797-55-8
N-O3
MW 62.01

Tissue	Cases Exposure Route	Range	Mean	General Information
9582 Blood		13-18+/-1.0 mg/kg	16 mg/kg	6 replicate analyses. Coefficient of variation=12% GC
NITRATES; URINE; SALIVA; BLOOD; MEASUREMENT METHODS Bull, B.J.; Hotchkiss, J.H. 1984 Food and Chemical Toxicology 22(2):105-106				

Nitrate
14797-55-8
N-O3
MW 62.01

Tissue	Cases Exposure Route	Range	Mean	General Information
9588 Saliva	a) 1 b) 1 c) 1 d) 1 e) 1 Ingestion	a) 21-100 ug/ml b) Not given c) 40, 80 ug/ml d) Not given e) 35-110 ug/ml	a) Not given b) 95 ug/ml c) Not given d) 60 ug/ml e) Not given	a) Challenge doses of K-nitrate=25-170 mg b) Dose=170 mg c) Doses=100, 170 mg d) Dose=100 mg e) Doses=25-100 mg Dosed after 72 hr of nitrate-free diets. Max levels 30-60 min after dosing, decreasing to almost 0 after 5 hr. Healthy adult volunteers
NITRATES; NITRITES; URINE; SALIVA; DELIBERATE EXPOSURE; UNITED KINGDOM; ADULTS; FOOD ADDITIVES Bartholomew, B.; Hill, M.J. 1984 Food and Chemical Toxicology 22(10):789-795				

Tissue	Cases Exposure Route	Range	Mean	General Information
9584 Saliva		16-17+/-0.37 mg/kg	17 mg/kg	6 replicate analyses. Coefficient of variation=2.2% QC
NITRATES; URINE; SALIVA; BLOOD; MEASUREMENT METHODS Bull, B.J.; Hotchkiss, J.H. 1984 Food and Chemical Toxicology 22(2):105-108				

Tissue	Cases Exposure Route	Range	Mean	General Information
9585 Urine	a) 1 b) 1 c) 1 d) 1 e) 1 f) 1 Ingestion	a) Not given b) Not given c) Not given d) Not given e) Not given f) Not given	a) 60-65% b) 65-70% c) 60-61% d) 50-62% e) 68-73% f) 68-70%	a) Challenge doses of K-nitrate=25-170 mg b) Dose=50-170 mg c) Doses=100, 170 mg d) Doses=50, 100 mg e) Doses=25-100 mg f) Doses=50, 100 mg Dosed after 72 hr of nitrate-free diets. Percentage of dose recovered in 24 hr following challenge. Max levels 4-6 hr after dosing, decreasing to baseline within 24 hr. Healthy adult volunteers
NITRATES; NITRITES; URINE; SALIVA; DELIBERATE EXPOSURE; UNITED KINGDOM; ADULTS; FOOD ADDITIVES Bartholomew, B.; Hill, M.J. 1984 Food and Chemical Toxicology 22(10):789-795				

Tissue	Cases Exposure Route	Range	Mean	General Information
9586 Urine		5.3-5.8+/-0.18 mg/kg	5.5 mg/kg	6 replicate analyses. Coefficient of variation=3.3% QC
NITRATES; URINE; SALIVA; BLOOD; MEASUREMENT METHODS Bull, B.J.; Hotchkiss, J.H. 1984 Food and Chemical Toxicology 22(2):105-108				

Nitrite

14797-65-0
N-O2
MW 30.00

Tissue	Cases Exposure Route	Range	Mean	General Information
9587 Saliva	a) 1 b) 1 c) 1 d) 1 e) 1	a) 17-96 ug/ml b) Not given c) 140, 285 ug/ml d) Not given e) 0-6 ug/ml	a) Not given b) 120 ug/ml c) Not given d) 51 ug/ml e) Not given	a) Challenge doses of K-nitrate=25-170 mg b) Dose=170 mg c) Doses=100, 170 mg d) Dose=100 mg e) Doses=25-100 mg Dosed after 72 hr of nitrate-free diets. Max levels 30-60 min after dosing, decreasing to almost 0 after 5 hr. Healthy adult volunteers
NITRATES; NITRITES; URINE; SALIVA; DELIBERATE EXPOSURE; UNITED KINGDOM; ADULTS; FOOD ADDITIVES Bartholomew, B.; Hill, M.J. 1984 Food and Chemical Toxicology 22(10):789-795				

Tissue	Cases Exposure Route	Range	Mean	General Information
9588 Saliva	a) 4 b) 9 c) 10 Ingestion	a) <1-8 ug/l b) <1-10 ug/l c) <1-6 ug/l	a) Not given b) Not given c) Not given	a) Lab workers handling nitrosamines b) Other lab workers c) Non-lab workers After meal, no fish, cured meat, fruit (excludes ascorbic acid) 26-50 yr old nonsmokers GC-MS
ADULTS; UNITED KINGDOM; BLOOD; COMPARATIVE EVALUATIONS; FOODS; MEAT; VEGETABLES; DIETS; ENVIRONMENTAL EXPOSURE; DELIBERATE EXPOSURE; OCCUPATIONAL EXPOSURE Gough, T.A.; Webb, K.S.; Swann, P.F. 1983 Food and Chemical Toxicology 21(2):151-156				

Nitrogen

7727-37-9
N
AtW 14.0067, MP -210.01 C, BP -195.79 C, VP 34 atm at -146.9 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9589 Urine	a) 15 b) 15 Ingestion	a) Not given b) Not given	a) 8.1+/-0.2 g/10 hr b) 5.4+/-0.5 g/10 hr S.E.	a) Controls b) Hyperkinetic, $p<0.01$ Study suggests possible differences in protein metabolism which may be useful in screening and categorizing hyperkinetic children. White males, 8-10 yr, Philadelphia area Spectroscopy
URINE; NITROGEN; PENNSYLVANIA; CHILDREN; BIOINDICATORS; BEHAVIOR DISORDERS; METABOLISM Stein, T.P.; Sammaritano, A.M. 1984 American Journal of Clinical Nutrition 39: 520-524				

Orotic acid (8 CI); 4-Pyrimidinecarboxylic acid, 1,2,3,6-tetrahydro-2,6-dioxo- (9 CI)
65-86-1
C5-H4-N2-O4
MW 156.10, MP 345-346 C

Tissue	Cases / Exposure Route	Range	Mean	General Information
9500 Urine	20 Ingestion	1 to 26%	10.5% (624+/-166 mg, S.E.)	% of 6 g dose, measured as orotate. Excretion peak at 4 hr, complete at 8 hr In separate study of 4 of above subjects dosed with 1, 3 and 6 g, excretion was proportional to dose. 19 men, 10 women (healthy 22-62 yr old, all university students and employees): HPLC
BLOOD SERUM; URINE; DELIBERATE EXPOSURE; ILLINOIS; ADULTS; COMPARATIVE EVALUATIONS; CHOLESTEROLS; PHOSPHORUS; METABOLITES Robinson, J.L.; Dombrowski, D.B. 1988 Nutrition Research 8:407-415				

Oxalic acid (8 CI); Ethanedioic acid (9 CI)
144-62-7
C2-H2-O4
MW 90.04, MP 101-102 C, BP 150 C (sublimes)

Tissue	Cases Exposure Route	Range	Mean	General Information
9501 Urine	1 Ingestion	0.45-0.57 mmol/24 hr	Not applicable	Ranges of means after 4 ingestion experiments using oxalate-rich meals: one each of spinach, rhubarb, Ca-oxalate, Na-oxalate (oxalate content 5.8-10.5 mmol per meal). 2.4% absorbed, mostly in the proximal small bowel. Healthy 57 yr old, body surface area 1.55 sq m Colorimetry
URINE; DELIBERATE EXPOSURE; DIETS Prenen, J.A.C.; Boer, P.; Meee, E.J.D. 1986 American Journal of Clinical Nutrition 40:1007-1010				

Paraxanthine (8 CI); 1H-Purine-2,6-dione, 3,7-dihydro-1,7-dimethyl- (9 CI)
611-59-6
C7-H8-N4-O2

Tissue	Cases Exposure Route	Range	Mean	General Information
9502 Blood	118	0-8.3 ug/ml	0.67+/-0.476 ug/ml	From umbilicial cord blood, sampled at delivery. New assay for caffeine and metabolites. Results suggest fetal exposure to caffeine and dimethylxanthenes higher than previously indicated. Newborn, Leeds Maternity Hospital, Leeds, UK HPLC
FETAL BLOOD; ENVIRONMENTAL EXPOSURE; FETUS; CAFFEINE; THEOPHYLLINES; BIOACCUMULATION; PREGNANCY; DRUGS Hartley, R.; Cookman, J.R.; Smith, I.J. 1984 Journal of Chromatography 306:191-203				

Phenol
108-95-2
C6-H6-O
MW 94.11, MP 40.85 C, BP 182 C, VP 1 mm Hg at 40.1 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9598 Urine				Review. General information, reported levels, sources of exposure, metabolites, and methods of analysis for: phthalate ester plasticizers, chlorophenoxy acid herbicides, chlorophenol biocides, p-nitrophenol, simple phenols, benzenediols, and toluene.
URINE; ENVIRONMENTAL EXPOSURE; OCCUPATIONAL EXPOSURE; DELIBERATE EXPOSURE; CONSUMER EXPOSURE; ADULTS; REVIEW; CARCINOMAS; POISONING; MEASUREMENT METHODS; PESTICIDES; INDUSTRIAL CHEMICALS; HERBICIDES; INSECTICIDES; FUNGICIDES; PENTACHLOROPHENOL; SOLVENTS; BENZENES; PHENOLS; INDUSTRIAL POLLUTION; TOLUENE; BLOOD; CARCINOGEN; METABOLISM; METABOLITES; WOOD PRESERVATIVES Fatiadi, A.J. 1988 Priority Toxic Pollutants in Human Urine: Their Occurrence and Analysis, Aug. 1988, 60 p				

Phenol, p-nitro- (8 CI); Phenol, 4-nitro- (9 CI)
100-02-7
C6-H5-N-O3
MW 139.11, MP 114.9-115.6 C, BP 279 C (decomp)

Tissue	Cases Exposure Route	Range	Mean	General Information
9594 Urine				Review. General information, reported levels, sources of exposure, metabolites, and methods of analysis for: phthalate ester plasticizers, chlorophenoxy acid herbicides, chlorophenol biocides, p-nitrophenol, simple phenols, benzenediols, and toluene.
URINE; ENVIRONMENTAL EXPOSURE; OCCUPATIONAL EXPOSURE; DELIBERATE EXPOSURE; CONSUMER EXPOSURE; ADULTS; REVIEW; CARCINOMAS; POISONING; MEASUREMENT METHODS; PESTICIDES; INDUSTRIAL CHEMICALS; HERBICIDES; INSECTICIDES; FUNGICIDES; PENTACHLOROPHENOL; SOLVENTS; BENZENES; PHENOLS; INDUSTRIAL POLLUTION; TOLUENE; BLOOD; CARCINOGEN; METABOLISM; METABOLITES; WOOD PRESERVATIVES Fatiadi, A.J. 1988 Priority Toxic Pollutants in Human Urine: Their Occurrence and Analysis, Aug. 1988, 60 p				

Phenol, pentachloro-
87-86-5
C6-H-Cl5-O
MW 266.35, MP 190-191 C, BP 309-310 C (decomp), VP 40 mm Hg at 211.2 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9595 Adipose	a) 91 b) 84	a) Not detectable-277 ng/g b) Not detectable-168 ng/g	a) 34+/-43 ng/g b) 22+/-22 ng/g	a) Kingston b) Ottawa Single samples from greater omentum of each cadaver. In general, residue values in entire survey of 20 compounds slightly higher in Kingston. No significant differences by sex. Autopsies, unembalmed cadavers, 11/79-1/81, Kingston, Ontario (a Great Lakes Community) and 11/80-1/81, Ottawa, Ontario (outside Great Lakes Basin), Canada. Age ranges 7-88 yr, 16-91 yr, respectively. GC/MS
ADIPOSE TISSUE; CANADA; AUTOPSIES; PESTICIDES; ENVIRONMENTAL EXPOSURE; CHLORINE ORGANIC COMPOUNDS; CHLOROBENZENES; WATER POLLUTION Williams, D.T.; LeBel, G.L.; Junkins, E. 1984 Journal of Toxicology and Environmental Health 13:19-29				

Phenol, pentachloro-
87-86-5
C6-H-Cl5-O
MW 266.35, MP 190-191 C, BP 309-310 C (decomp), VP 40 mm Hg at 211.2 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9606 Blood, serum	a) 31 b) 40 c) 351 Inhalation Dermal	a) Not given b) Not given c) Not given	a) 241+/-232 ppb b) 714+/-363 ppb c) 58+/-16 ppb	a) Workers exposed to airborne levels of 5+/-8 ppb b) Workers exposed to dermal levels of 6+/-9 ppb c) Workers with no immediate exposure Sawmill workers GC
BLOOD SERUM; URINE; OCCUPATIONAL EXPOSURE; CANADA; ADULTS; INDUSTRIAL DISEASES; CHLORINATED HYDROCARBONS; PENTACHLOROPHENOL; BIOACCUMULATION; BIOLOGICAL MONITORING; FORESTRY; HEALTH HAZARDS; INDUSTRIAL ATMOSPHERES; INDUSTRIAL POLLUTION; INHALATION; OCCUPATIONAL HAZARDS; SMOKING Embree, V.; Enarson, D.A.; Chan-Yeung, M.; DyBunico, A.; Dennis, R.; Leach, J. 1984 Clinical Toxicology 22(4):317-329				

Tissue	Cases Exposure Route	Range	Mean	General Information
9607 Blood, serum	4 Inhalation Dermal	a) Not given b) Not given c) Not given d) Not given	a) 27.8 ppm b) 80.2 ppm c) 20.2 ppm d) 20.8 ppm	a) Worker A b) Worker B c) Worker C d) Supervisor Wood preservative manufacturing plant employees Weakness, vomiting, diaphoresis, hyperpyrexia, abdominal pain
ADULTS; NERVOUS SYSTEM DISEASES; URINE; BLOOD SERUM; INDUSTRIAL MEDICINE; PENTACHLOROPHENOL; PESTICIDES; ACCIDENTAL POISONING; INDUSTRIAL ATMOSPHERES; INDUSTRIAL PLANTS; OCCUPATIONAL EXPOSURE Wood, S.; Rom, W.N.; White, G.L.; Logan, D.C. 1983 Journal of Occupational Medicine 25(7):527-530				

Tissue	Cases Exposure Route	Range	Mean	General Information
9608 Milk	21	0.03-2.88 ug/kg	0.68+/-0.05 ug/kg	20 ml samples. Possible environmental sources discussed. Nursing mothers in Upper Bavaria, 1979-1981 GC-EC
MILK; ENVIRONMENTAL EXPOSURE; GERMANY; ADULTS; PENTACHLOROPHENOL; FUNGICIDES Gebefugi, I.; Korte, F. 1983 Chemosphere 12(7/8):1055-1060				

Tissue	Cases Exposure Route	Range	Mean	General Information
9609 Urine	a) 31 b) 40 Inhalation Dermal	a) Not given b) Not given	a) 45+/-15 ppb b) 105+/-18 ppb	a) Workers exposed to airborne levels of 5+/-8 ppb b) Workers exposed to dermal levels of 6+/-9 ppb Sawmill workers GC
BLOOD SERUM; URINE; OCCUPATIONAL EXPOSURE; CANADA; ADULTS; INDUSTRIAL DISEASES; CHLORINATED HYDROCARBONS; PENTACHLOROPHENOL; BIOACCUMULATION; BIOLOGICAL MONITORING; FORESTRY; HEALTH HAZARDS; INDUSTRIAL ATMOSPHERES; INDUSTRIAL POLLUTION; INHALATION; OCCUPATIONAL HAZARDS; SMOKING Embree, V.; Enarson, D.A.; Chan-Yeung, M.; DyBunico, A.; Dennis, R.; Leach, J. 1984 Clinical Toxicology 22(4):317-329				

Phenol, pentachloro-
87-86-5
C6-H-Cl5-O
MW 266.86, MP 190-191 C, BP 309-310 C (decomp), VP 40 mm Hg at 211.2 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9600 Urine				Review. General information, reported levels, sources of exposure, metabolites, and methods of analysis for: phthalate ester plasticisers, chlorophenoxy acid herbicides, chlorophenol biocides, p-nitrophenol, simple phenols, benzenediols, and toluene.
URINE; ENVIRONMENTAL EXPOSURE; OCCUPATIONAL EXPOSURE; DELIBERATE EXPOSURE; CONSUMER EXPOSURE; ADULTS; REVIEW; CARCINOMAS; POISONING; MEASUREMENT METHODS; PESTICIDES; INDUSTRIAL CHEMICALS; HERBICIDES; INSECTICIDES; FUNGICIDES; PENTACHLOROPHENOL; SOLVENTS; BENZENES; PHENOLS; INDUSTRIAL POLLUTION; TOLUENE; BLOOD; CARCINOGEN; METABOLISM; METABOLITES; WOOD PRESERVATIVES Patiadi, A.J. 1983 Priority Toxic Pollutants in Human Urine: Their Occurrence and Analysis, Aug. 1983, 60 p				

Tissue	Cases Exposure Route	Range	Mean	General Information
9601 Urine	4 Inhalation Dermal	a) Not given b) Not given c) Not given d) Not given	a) 10.0 ppm b) 12.6 ppm c) 13.6 ppm d) 2.6 ppm	a) Worker A b) Worker B c) Worker C d) Supervisor Wood preservative manufacturing plant employees Weakness, vomiting, diaphoresis, hyperpyrexia, abdominal pain
ADULTS; NERVOUS SYSTEM DISEASES; URINE; BLOOD SERUM; INDUSTRIAL MEDICINE; PENTACHLOROPHENOL; PESTICIDES; ACCIDENTAL POISONING; INDUSTRIAL ATMOSPHERES; INDUSTRIAL PLANTS; OCCUPATIONAL EXPOSURE Wood, S.; Rom, W.N.; White, G.L.; Logan, D.C. 1983 Journal of Occupational Medicine 25(7):527-530				

Phenol, tert-butyl-4-methoxy- (8 CI); Phenol, (1,1-dimethylethyl)-4-methoxy- (9 CI)
25013-16-5
C11-H16-O2
MW 180.27, MP 46-48 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9602 Blood, plasma	4 Ingestion	a) 14.14+/-11.3 ng/ml-undetectable b) 73.08+/-32.0 ng/ml-undetectable	a) Not given b) Not given	a) At 142.5+/-56.8 and 360 min after 5 mg dose b) At 108.75+/-41.7 and 720 min after 30 mg dose Ranges of means. Compound given in olive oil capsule. Similar concentration profiles in a) and b). New assay. Some values estimated from figure. Healthy volunteers GC/MS
9603 Urine	4 Ingestion	a) 16-30% b) 18-22%	a) Not given b) Not given	a) Cumulative excretion of total BHA 0-24 hr after 5 mg dose. About 0.05% free BHA b) 30 mg dose Compound given in olive oil. New assay. Healthy volunteers GC/MS
BLOOD PLASMA; URINE; DELIBERATE EXPOSURE; MEASUREMENT METHODS; FOOD ADDITIVES; FOOD PRESERVATIVES; METABOLISM Castelli, M.G.; Benfenati, E.; Pastorelli, R.; Salmona, M.; Fanelli, R. 1984 Food and Chemical Toxicology 22(11):901-904				

Phenol, tetrachloro-
25167-83-3
C6-H2-Cl4-O

Tissue	Cases Exposure Route	Range	Mean	General Information
9604 Blood, serum	a) 31 b) 40 c) 851 Inhalation Dermal	a) Not given b) Not given c) Not given	a) 112+/-136 ppb b) 204+/-92 ppb c) 26+/-7 ppb	a) Workers exposed to airborne levels of 31+/-20 ppb b) Workers exposed to dermal levels of 29+/-26 ppb c) Workers with no immediate exposure Sawmill workers GC
9605 Urine	a) 31 b) 40 Inhalation Dermal	a) Not given b) Not given	a) 98+/-43 ppb b) 126+/-20 ppb	a) Workers exposed to airborne levels of 31+/-20 ppb b) Workers exposed to dermal levels of 29+/-26 ppb Sawmill workers GC
BLOOD SERUM; URINE; OCCUPATIONAL EXPOSURE; CANADA; ADULTS; INDUSTRIAL DISEASES; CHLORINATED HYDROCARBONS; PENTACHLOROPHENOL; BIOACCUMULATION; BIOLOGICAL MONITORING; FORESTRY; HEALTH HAZARDS; INDUSTRIAL ATMOSPHERES; INDUSTRIAL POLLUTION; INHALATION; OCCUPATIONAL HAZARDS; SMOKING Embree, V.; Emerson, D.A.; Chan-Yeung, M.; DyBunico, A.; Dennie, R.; Leach, J. 1984 Clinical Toxicology 22(4):317-329				

Phenol, 2,2'-methylenebis(3,4,6-trichloro-
70-30-4
C13-H6-Cl6-O2
MW 406.92, MP 164-166 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9606 Blood, serum	28 Vaginal	a) <100-942 ng/ml b) <100-617 ng/ml	a) Not given b) Not given	a) Sampled once 30 min after delivery b) Mixed cord serum, sampled at delivery, same subjects. 1/2 teaspoon (8% solution), as glove lubricant for vaginal examinations during labor. 2-11 examinations/subject. Labor >4 hr duration correlated significantly with presence of detectable levels (>100 ug/ml). Women in active labor, at term, Texas GC
BLOOD SERUM; DELIBERATE EXPOSURE; ENVIRONMENTAL EXPOSURE; TEXAS; ADULTS; NEWBORN; HEXACHLOROPHENE; HEALTH HAZARDS; PREGNANCY; TRANSPLACENTAL TRANSFER Strickland, D.M.; Leonard, R.G.; Stavchansky, S.; Benoit, T.; Wilson, R.T. 1983 American Journal of Obstetrics and Gynecology 147: 769-772				

Phenol, 2,3-dichloro-
576-24-9
C6-H4-Cl2-O
MW 163.00, MP 57-59 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9607 Urine				Review. General information, reported levels, sources of exposure, metabolites, and methods of analysis for: phthalate ester plasticisers, chlorophenoxy acid herbicides, chlorophenol biocides, p-nitrophenol, simple phenols, benzenediols, and toluene.

URINE; ENVIRONMENTAL EXPOSURE; OCCUPATIONAL EXPOSURE; DELIBERATE EXPOSURE; CONSUMER EXPOSURE; ADULTS; REVIEW; CARCINOMAS; POISONING; MEASUREMENT METHODS; PESTICIDES; INDUSTRIAL CHEMICALS; HERBICIDES; INSECTICIDES; FUNGICIDES; PENTACHLOROPHENOL; SOLVENTS; BENZENES; PHENOLS; INDUSTRIAL POLLUTION; TOLUENE; BLOOD; CARCINOGEN; METABOLISM; METABOLITES; WOOD PRESERVATIVES
Patiadi, A.J. 1983 Priority Toxic Pollutants in Human Urine: Their Occurrence and Analysis, Aug. 1983, 60 p

Phenol, 2,3,4,5-tetrachloro-
4901-51-3
C6-H2-Cl4-O
MW 231.89, MP 116-117 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9608 Adipose	a) 91 b) 84	a) Not detected-22 ng/g b) Not detected-22 ng/g	a) 6+/-3 ng/g b) 7+/-4 ng/g	a) Kingston b) Ottawa Single samples from greater omentum of each cadaver. In general, residue values in entire survey of 20 compounds slightly higher in Kingston. No significant differences by sex. Autopsies, unembalmed cadavers, 11/79-1/81, Kingston, Ontario (a Great Lakes Community) and 11/80-1/81, Ottawa, Ontario (outside Great Lakes Basin), Canada. Age ranges 7-88 yr, 16-91 yr, respectively. GC/MS

ADIPOSE TISSUE; CANADA; AUTOPSIES; PESTICIDES; ENVIRONMENTAL EXPOSURE; CHLORINE ORGANIC COMPOUNDS; CHLOROBENZENES; WATER POLLUTION
Williams, D.T.; LeBel, G.L.; Junkins, E. 1984 Journal of Toxicology and Environmental Health 13:19-29

Tissue	Cases Exposure Route	Range	Mean	General Information
9609 Urine				Review. General information, reported levels, sources of exposure, metabolites, and methods of analysis for: phthalate ester plasticisers, chlorophenoxy acid herbicides, chlorophenol biocides, p-nitrophenol, simple phenols, benzenediols, and toluene.

URINE; ENVIRONMENTAL EXPOSURE; OCCUPATIONAL EXPOSURE; DELIBERATE EXPOSURE; CONSUMER EXPOSURE; ADULTS; REVIEW; CARCINOMAS; POISONING; MEASUREMENT METHODS; PESTICIDES; INDUSTRIAL CHEMICALS; HERBICIDES; INSECTICIDES; FUNGICIDES; PENTACHLOROPHENOL; SOLVENTS; BENZENES; PHENOLS; INDUSTRIAL POLLUTION; TOLUENE; BLOOD; CARCINOGEN; METABOLISM; METABOLITES; WOOD PRESERVATIVES
Patiadi, A.J. 1983 Priority Toxic Pollutants in Human Urine: Their Occurrence and Analysis, Aug. 1983, 60 p

Phenol, 2,3,4,6-tetrachloro-
58-90-2
C6-H2-Cl4-O
MW 231.9, MP 69-70 C, 258 C (decomp), VP 1 mm Hg at 100.0 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9610 Urine				Review. General information, reported levels, sources of exposure, metabolites, and methods of analysis for: phthalate ester plasticisers, chlorophenoxy acid herbicides, chlorophenol biocides, p-nitrophenol, simple phenols, benzenediols, and toluene.

URINE; ENVIRONMENTAL EXPOSURE; OCCUPATIONAL EXPOSURE; DELIBERATE EXPOSURE; CONSUMER EXPOSURE; ADULTS; REVIEW; CARCINOMAS; POISONING; MEASUREMENT METHODS; PESTICIDES; INDUSTRIAL CHEMICALS; HERBICIDES; INSECTICIDES; FUNGICIDES; PENTACHLOROPHENOL; SOLVENTS; BENZENES; PHENOLS; INDUSTRIAL POLLUTION; TOLUENE; BLOOD; CARCINOGEN; METABOLISM; METABOLITES; WOOD PRESERVATIVES

Patiadi, A.J. 1983 Priority Toxic Pollutants in Human Urine: Their Occurrence and Analysis, Aug. 1983, 60 p

Phenol, 2,4-dichloro-
120-83-2
C6-H4-Cl2-O
MW 163.0, MP 45 C, BP 209-210 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9611 Urine				Review. General information, reported levels, sources of exposure, metabolites, and methods of analysis for: phthalate ester plasticisers, chlorophenoxy acid herbicides, chlorophenol biocides, p-nitrophenol, simple phenols, benzenediols, and toluene.

URINE; ENVIRONMENTAL EXPOSURE; OCCUPATIONAL EXPOSURE; DELIBERATE EXPOSURE; CONSUMER EXPOSURE; ADULTS; REVIEW; CARCINOMAS; POISONING; MEASUREMENT METHODS; PESTICIDES; INDUSTRIAL CHEMICALS; HERBICIDES; INSECTICIDES; FUNGICIDES; PENTACHLOROPHENOL; SOLVENTS; BENZENES; PHENOLS; INDUSTRIAL POLLUTION; TOLUENE; BLOOD; CARCINOGEN; METABOLISM; METABOLITES; WOOD PRESERVATIVES

Patiadi, A.J. 1983 Priority Toxic Pollutants in Human Urine: Their Occurrence and Analysis, Aug. 1983, 60 p

Phenol, 2,4,5-trichloro-
95-95-4
C6-H3-Cl3-O
MW 197.5, BP 252 C, VP 1 mm Hg at 72 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9612 Urine				Review. General information, reported levels, sources of exposure, metabolites, and methods of analysis for: phthalate ester plasticisers, chlorophenoxy acid herbicides, chlorophenol biocides, p-nitrophenol, simple phenols, benzenediols, and toluene.

URINE; ENVIRONMENTAL EXPOSURE; OCCUPATIONAL EXPOSURE; DELIBERATE EXPOSURE; CONSUMER EXPOSURE; ADULTS; REVIEW; CARCINOMAS; POISONING; MEASUREMENT METHODS; PESTICIDES; INDUSTRIAL CHEMICALS; HERBICIDES; INSECTICIDES; FUNGICIDES; PENTACHLOROPHENOL; SOLVENTS; BENZENES; PHENOLS; INDUSTRIAL POLLUTION; TOLUENE; BLOOD; CARCINOGEN; METABOLISM; METABOLITES; WOOD PRESERVATIVES

Patiadi, A.J. 1983 Priority Toxic Pollutants in Human Urine: Their Occurrence and Analysis, Aug. 1983, 60 p

Phenol, 2,4,6-trichloro-
88-06-2
C6-H3-Cl3-O
MW 197.5, MP 68 C, BP 244.5 C, VP 1 mm Hg at 76.5 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9618 Urine				Review. General information, reported levels, sources of exposure, metabolites, and methods of analysis for: phthalate ester plasticizers, chlorophenoxy acid herbicides, chlorophenol biocides, p-nitrophenol, simple phenols, benzenediols, and toluene.

URINE; ENVIRONMENTAL EXPOSURE; OCCUPATIONAL EXPOSURE; DELIBERATE EXPOSURE; CONSUMER EXPOSURE; ADULTS; REVIEW; CARCINOMAS; POISONING; MEASUREMENT METHODS; PESTICIDES; INDUSTRIAL CHEMICALS; HERBICIDES; INSECTICIDES; FUNGICIDES; PENTACHLOROPHENOL; SOLVENTS; BENZENES; PHENOLS; INDUSTRIAL POLLUTION; TOLUENE; BLOOD; CARCINOGEN; METABOLISM; METABOLITES; WOOD PRESERVATIVES
Patiadi, A.J. 1983 Priority Toxic Pollutants in Human Urine: Their Occurrence and Analysis, Aug. 1983, 60 p

Phenol, 2,6-dichloro-
87-65-0
C6-H4-Cl2-O
MW 163.00, MP 66-69 C, BP 210-220 C at 740 mm Hg, VP 1 mm Hg at 59.5 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9614 Urine				Review. General information, reported levels, sources of exposure, metabolites, and methods of analysis for: phthalate ester plasticizers, chlorophenoxy acid herbicides, chlorophenol biocides, p-nitrophenol, simple phenols, benzenediols, and toluene.

URINE; ENVIRONMENTAL EXPOSURE; OCCUPATIONAL EXPOSURE; DELIBERATE EXPOSURE; CONSUMER EXPOSURE; ADULTS; REVIEW; CARCINOMAS; POISONING; MEASUREMENT METHODS; PESTICIDES; INDUSTRIAL CHEMICALS; HERBICIDES; INSECTICIDES; FUNGICIDES; PENTACHLOROPHENOL; SOLVENTS; BENZENES; PHENOLS; INDUSTRIAL POLLUTION; TOLUENE; BLOOD; CARCINOGEN; METABOLISM; METABOLITES; WOOD PRESERVATIVES
Patiadi, A.J. 1983 Priority Toxic Pollutants in Human Urine: Their Occurrence and Analysis, Aug. 1983, 60 p

Phenol, 3,4-dichloro-
95-77-2
C6-H4-Cl2-O
MW 163.00, MP 68 C, BP 253.5 C at 767 mm Hg

Tissue	Cases Exposure Route	Range	Mean	General Information
9615 Urine				Review. General information, reported levels, sources of exposure, metabolites, and methods of analysis for: phthalate ester plasticizers, chlorophenoxy acid herbicides, chlorophenol biocides, p-nitrophenol, simple phenols, benzenediols, and toluene.

URINE; ENVIRONMENTAL EXPOSURE; OCCUPATIONAL EXPOSURE; DELIBERATE EXPOSURE; CONSUMER EXPOSURE; ADULTS; REVIEW; CARCINOMAS; POISONING; MEASUREMENT METHODS; PESTICIDES; INDUSTRIAL CHEMICALS; HERBICIDES; INSECTICIDES; FUNGICIDES; PENTACHLOROPHENOL; SOLVENTS; BENZENES; PHENOLS; INDUSTRIAL POLLUTION; TOLUENE; BLOOD; CARCINOGEN; METABOLISM; METABOLITES; WOOD PRESERVATIVES
Patiadi, A.J. 1983 Priority Toxic Pollutants in Human Urine: Their Occurrence and Analysis, Aug. 1983, 60 p

Phenol, 3,4,5-trichloro-
609-19-8
C6-H3-Cl3-O
MW 197.45, MP 101 C, BP 271-277 C at 746 mm Hg

Tissue	Cases Exposure Route	Range	Mean	General Information
9616 Urine				Review. General information, reported levels, sources of exposure, metabolites, and methods of analysis for: phthalate ester plasticizers, chlorophenoxy acid herbicides, chlorophenol biocides, p-nitrophenol, simple phenols, benzenediols, and toluene.
URINE; ENVIRONMENTAL EXPOSURE; OCCUPATIONAL EXPOSURE; DELIBERATE EXPOSURE; CONSUMER EXPOSURE; ADULTS; REVIEW; CARCINOMAS; POISONING; MEASUREMENT METHODS; PESTICIDES; INDUSTRIAL CHEMICALS; HERBICIDES; INSECTICIDES; FUNGICIDES; PENTACHLOROPHENOL; SOLVENTS; BENZENES; PHENOLS; INDUSTRIAL POLLUTION; TOLUENE; BLOOD; CARCINOGEN; METABOLISM; METABOLITES; WOOD PRESERVATIVES Patiadi, A.J. 1983 Priority Toxic Pollutants in Human Urine: Their Occurrence and Analysis, Aug. 1983, 60 p				

Phosphine (VAN)
7803-51-2
H3-P
MW 34.04, MP -132.5 C (also reported as -133.5 C), BP -87.5 C, VP 40 mm Hg at -129.4 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9617 Blood	1 Ingestion	Not given	0.5 ng/mL	Post mortem, after unknown quantity Al phosphide (Phostoxin) tablets Phosphide particles absorbed from alimentary tract, converted into phosphine by acidification of samples. 27-yr old poisoning victim GC/Nitrogen phosphorus detector
9618 Liver	1 Ingestion	Not given	3 ng/g	Post mortem, after unknown quantity Al phosphide (Phostoxin) tablets Phosphide particles absorbed from alimentary tract, converted into phosphine by acidification of samples. 27-yr old poisoning victim GC/Nitrogen phosphorus detector
9619 Stomach	1 Ingestion	Not given	3000 ng/g	Post mortem, after unknown quantity Al phosphide (Phostoxin) tablets In stomach and contents. Phosphide particles converted into phosphine by acidification of samples. Presence confirmed by colorimetry and GC/MS. 27-yr old poisoning victim GC/Nitrogen phosphorus detector
BLOOD; LIVER; STOMACH; URINE; DELIBERATE EXPOSURE; AUTOPSIES; CADAVERS; CASE HISTORIES; ALUMINUM Chen, L.T.P.; Dellou, C.D.; Geyer, R. 1983 Journal of Analytical Toxicology 7:166-167				

Phosphoric acid, diethyl ester
598-02-7
C4-H11-O4-P
MW 154.10, BP 203.3 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9620 Urine				Review. General information, reported levels, sources of exposure, metabolites, and methods of analysis for: phthalate ester plasticizers, chlorophenoxy acid herbicides, chlorophenol biocides, p-nitrophenol, simple phenols, benzenediols, and toluene.
URINE; ENVIRONMENTAL EXPOSURE; OCCUPATIONAL EXPOSURE; DELIBERATE EXPOSURE; CONSUMER EXPOSURE; ADULTS; REVIEW; CARCINOMAS; POISONING; MEASUREMENT METHODS; PESTICIDES; INDUSTRIAL CHEMICALS; HERBICIDES; INSECTICIDES; FUNGICIDES; PENTACHLOROPHENOL; SOLVENTS; BENZENES; PHENOLS; INDUSTRIAL POLLUTION; TOLUENE; BLOOD; CARCINOGEN; METABOLISM; METABOLITES; WOOD PRESERVATIVES Patiadi, A.J. 1983 Priority Toxic Pollutants in Human Urine: Their Occurrence and Analysis, Aug. 1983, 60 p				

Phosphoric acid, dimethyl ester
813-78-5
C2-H7-O4-P
MW 126.05, BP 172-176 (decomp)

Tissue	Cases Exposure Route	Range	Mean	General Information
9621 Urine				Review. General information, reported levels, sources of exposure, metabolites, and methods of analysis for: phthalate ester plasticizers, chlorophenoxy acid herbicides, chlorophenol biocides, p-nitrophenol, simple phenols, benzenediols, and toluene.
URINE; ENVIRONMENTAL EXPOSURE; OCCUPATIONAL EXPOSURE; DELIBERATE EXPOSURE; CONSUMER EXPOSURE; ADULTS; REVIEW; CARCINOMAS; POISONING; MEASUREMENT METHODS; PESTICIDES; INDUSTRIAL CHEMICALS; HERBICIDES; INSECTICIDES; FUNGICIDES; PENTACHLOROPHENOL; SOLVENTS; BENZENES; PHENOLS; INDUSTRIAL POLLUTION; TOLUENE; BLOOD; CARCINOGEN; METABOLISM; METABOLITES; WOOD PRESERVATIVES Patiadi, A.J. 1983 Priority Toxic Pollutants in Human Urine: Their Occurrence and Analysis, Aug. 1983, 60 p				

Phosphoric acid, 2,2-dichlorovinyl dimethyl ester (8 CI); Phosphoric acid, 2,2-dichloroethenyl dimethyl ester (9 CI)
62-73-7
C4-H7-Cl2-O4-P
MW 220.98, BP 120 C at 14 mm Hg

Tissue	Cases Exposure Route	Range	Mean	General Information
9622 Urine	3 Inhalation	a) 0.32-1.30 ug b) 0-0.74 ug c) Not detected	a) Not given b) Not given c) Not detected	a) 3 hr b) 6 hr c) 18 hr Times after application to 4 homes. Total of 230-330 g as aerosol, 40-50 g as emulsion spray. Ranges of means. Mean residues on back, chest, respirator of operators 75, 40.9, 7.02 ug/sq ft respectively Pest control operators GC
URINE; COMPARATIVE EVALUATIONS; INSECTICIDES; ADULTS; HEALTH HAZARDS; INHALATION; OCCUPATIONAL HAZARDS; PESTICIDE RESIDUES; PESTICIDES Das, Y.T.; Tasker, P.K.; Brown, H.D.; Chattopadhyay, S.K. 1983 Toxicology Letters 17:95-99				

Phosphorodithioic acid, O,O-dimethyl ester
756-80-9
C2-H7-O2-P-S2
MW 158.18

Tissue	Cases Exposure Route	Range	Mean	General Information
9625 Urine				Review. General information, reported levels, sources of exposure, metabolites, and methods of analysis for: phthalate ester plasticizers, chlorophenoxy acid herbicides, chlorophenol biocides, p-nitrophenol, simple phenols, benzenediols, and toluene.
URINE; ENVIRONMENTAL EXPOSURE; OCCUPATIONAL EXPOSURE; DELIBERATE EXPOSURE; CONSUMER EXPOSURE; ADULTS; REVIEW; CARCINOMAS; POISONING; MEASUREMENT METHODS; PESTICIDES; INDUSTRIAL CHEMICALS; HERBICIDES; INSECTICIDES; FUNGICIDES; PENTACHLOROPHENOL; SOLVENTS; BENZENES; PHENOLS; INDUSTRIAL POLLUTION; TOLUENE; BLOOD; CARCINOGEN; METABOLISM; METABOLITES; WOOD PRESERVATIVES Patiadi, A.J. 1983 Priority Toxic Pollutants in Human Urine: Their Occurrence and Analysis, Aug. 1983, 60 p				

Phosphorothioic acid, O,O-diethyl ester
2465-65-8
C4-H11-O3-P-S
MW 170

Tissue	Cases Exposure Route	Range	Mean	General Information
9624 Urine				Review. General information, reported levels, sources of exposure, metabolites, and methods of analysis for: phthalate ester plasticizers, chlorophenoxy acid herbicides, chlorophenol biocides, p-nitrophenol, simple phenols, benzenediols, and toluene.
URINE; ENVIRONMENTAL EXPOSURE; OCCUPATIONAL EXPOSURE; DELIBERATE EXPOSURE; CONSUMER EXPOSURE; ADULTS; REVIEW; CARCINOMAS; POISONING; MEASUREMENT METHODS; PESTICIDES; INDUSTRIAL CHEMICALS; HERBICIDES; INSECTICIDES; FUNGICIDES; PENTACHLOROPHENOL; SOLVENTS; BENZENES; PHENOLS; INDUSTRIAL POLLUTION; TOLUENE; BLOOD; CARCINOGEN; METABOLISM; METABOLITES; WOOD PRESERVATIVES Patiadi, A.J. 1983 Priority Toxic Pollutants in Human Urine: Their Occurrence and Analysis, Aug. 1983, 60 p				

Phosphorothioic acid, O,O-diethyl O-(3,5,6-trichloro-2-pyridyl) ester (8 CI); Phosphorothioic acid, O,O-diethyl O-(3,5,6-trichloro-2-pyridinyl) ester (9 CI)
2921-88-2
C9-H11-Cl3-N-O3-P-S
MW 350.57, MP 41-42 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9625 Blood, plasma	1 Ingestion	Not applicable	<30 ng/g	1.6-28 hr. Not detected at 30 hr. Ingested 1200 mg/kg chlorophenoxy acetic acids (360 mL Dextol, 360 mL Weed-B-Gone M, few granules D-Con concentrate). Patient died at 30 hr. 26 yr old male, committed suicide, CA Coma, myoclonus, pinpoint pupils, cardiac arrhythmias, progressive hypotension, oliguria. Death after episodes of asystole. Congested, edematous lungs, denuded duodenal mucosa with recent hemorrhage, diffuse mild liver necrosis. HPLC; GC

(next page)

Phosphorothioic acid, O,O-diethyl O-(3,5,6-trichloro-2-pyridyl) ester (8 CI); Phosphorothioic acid, O,O-diethyl O-(3,5,6-trichloro-2-pyridinyl) ester (9 CI)
2921-88-2
C9-H11-Cl3-N-O3-P-S
MW 350.57, MP 41-42 C

(continued)

Tissue	Cases Exposure Route	Range	Mean	General Information
9626 Brain	1 Ingestion	a) Not given b) Not given	a) 91.0 ng/g b) 574.6 ng/g	a) Gray matter (frontal lobe) b) White matter (frontal lobe) Postmortem. Ingested 1200 mg/kg chlorophenoxy acetic acids (360 mL Dextol, 360 mL Weed-B-Gone M, few granules D-Con concentrate). Patient died at 30 hr. 26 yr old male, committed suicide, CA Coma, myoclonus, pinpoint pupils, cardiac arrhythmias, progressive hypotension, oliguria. Death after episodes of asystole. Congested, edematous lungs, denuded duodenal mucosa with recent hemorrhage, diffuse mild liver necrosis. HPLC; GC
9627 Kidney	1 Ingestion	Not given	415.6 ng/g	Postmortem. Not detected at 30 hr. Ingested 1200 mg/kg chlorophenoxy acetic acids (360 mL Dextol, 360 mL Weed-B-Gone M, few granules D-Con concentrate). Patient died at 30 hr. 26 yr old male, committed suicide, CA Coma, myoclonus, pinpoint pupils, cardiac arrhythmias, progressive hypotension, oliguria. Death after episodes of asystole. Congested, edematous lungs, denuded duodenal mucosa with recent hemorrhage, diffuse mild liver necrosis. HPLC; GC
9628 Liver	1 Ingestion	Not given	4187.0 ng/g	Postmortem. Not detected at 30 hr. Ingested 1200 mg/kg chlorophenoxy acetic acids (360 mL Dextol, 360 mL Weed-B-Gone M, few granules D-Con concentrate). Patient died at 30 hr. 26 yr old male, committed suicide, CA Coma, myoclonus, pinpoint pupils, cardiac arrhythmias, progressive hypotension, oliguria. Death after episodes of asystole. Congested, edematous lungs, denuded duodenal mucosa with recent hemorrhage, diffuse mild liver necrosis. HPLC; GC
9629 Pancreas	1 Ingestion	Not given	2373.2 ng/g	Postmortem. Not detected at 30 hr. Ingested 1200 mg/kg chlorophenoxy acetic acids (360 mL Dextol, 360 mL Weed-B-Gone M, few granules D-Con concentrate). Patient died at 30 hr. 26 yr old male, committed suicide, CA Coma, myoclonus, pinpoint pupils, cardiac arrhythmias, progressive hypotension, oliguria. Death after episodes of asystole. Congested, edematous lungs, denuded duodenal mucosa with recent hemorrhage, diffuse mild liver necrosis. HPLC; GC

BLOOD PLASMA; BILE; BRAIN; CEREBROSPINAL FLUID; BLOOD; LIVER; PANCREAS; HEART; DIAPHRAGM; KIDNEYS; DELIBERATE EXPOSURE; CALIFORNIA; SUICIDE; CASE HISTORIES; AUTOPSIES; HERBICIDES; PESTICIDES; INSECTICIDES; ORGANOPHOSPHATES

Osterloh, J.; Lotti, M.; Pond, S.M. 1983 Journal of Analytical Toxicology 7:125-129

Phosphorothioic acid, O,O-dimethyl ester
1112-38-5
C2-H7-O3-P-S
MW 284

Tissue	Cases Exposure Route	Range	Mean	General Information
9630 Urine				Review. General information, reported levels, sources of exposure, metabolites, and methods of analysis for: phthalate ester plasticizers, chlorophenoxy acid herbicides, chlorophenol biocides, p-nitrophenol, simple phenols, benzenediols, and toluene.
URINE; ENVIRONMENTAL EXPOSURE; OCCUPATIONAL EXPOSURE; DELIBERATE EXPOSURE; CONSUMER EXPOSURE; ADULTS; REVIEW; CARCINOMAS; POISONING; MEASUREMENT METHODS; PESTICIDES; INDUSTRIAL CHEMICALS; HERBICIDES; INSECTICIDES; FUNGICIDES; PENTACHLOROPHENOL; SOLVENTS; BENZENES; PHENOLS; INDUSTRIAL POLLUTION; TOLUENE; BLOOD; CARCINOGEN; METABOLISM; METABOLITES; WOOD PRESERVATIVES Patiadi, A.J. 1983 Priority Toxic Pollutants in Human Urine: Their Occurrence and Analysis, Aug. 1983, 60 p				

Phosphorothioic acid, O,O-dimethyl O-(4-nitro-m-tolyl) ester (8 CI); Phosphorothioic acid, O,O-dimethyl O-(3-methyl-4-nitrophenyl) ester (9 CI)
122-14-5
C9-H12-N-O5-P-S
MW 277.3, BP 118 C, also reported as 140-145 C (decomp), VP 6X10(E-6) mm Hg at 20 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9631 Blood, plasma	1 Ingestion	7.9-0.2 ug/ml	Not applicable	Degradation product, 4-nitro-3-methylpenol, 10 hr-5 wk after drinking 40 ml. Peak 8.5 ug/ml day 2. Delayed toxicity (48 hr) due to low activity of drug-metabolizing enzymes in liver. 70 yr old who attempted suicide, admitted to hospital 10 hr later Vomiting and diarrhea for several hr. 48 hr after ingestion, confusion, tremors, and muscle weakness. Incoherence and marked tachypnea with respiratory muscle palsy Spectrophotometry
9632 Urine	1 Ingestion	15.6-0.2 mg/hr	Not applicable	Degradation product, 4-nitro-3-methylpenol, 10 hr-4 wk after drinking 40 ml. Peak 36.7 mg/hr day 2. Delayed toxicity (48 hr) due to low activity of drug-metabolizing enzymes in liver. 70 yr old who attempted suicide, admitted to hospital 10 hr later Vomiting and diarrhea for several hr. 48 hr after ingestion, confusion, tremors, and muscle weakness. Incoherence and marked tachypnea with respiratory muscle palsy Spectrophotometry
BLOOD PLASMA; URINE; DELIBERATE EXPOSURE; CASE HISTORIES; SUICIDE; ORGANOPHOSPHATES; INSECTICIDES; METABOLITES; HEMOPERFUSION Sakamoto, T.; Sawada, Y.; Nishide, K.; Sadamitsu, D.; Yoshioka, T.; Sugimoto, T.; Nishii, S.; Kishi, H. 1984 Archives of Toxicology 56:136-138				

Phosphorus
7723-14-0
P
AtW 30.97376, MP 44.1 C, BP 280 C, VP 10 mm Hg at 127 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9633 Aorta	a) 3 b) 6 c) 7	a) 25,000-53,000 ppm b) 1,100-5,500 ppm c) Not given Dry wt	a) Not given b) Not given c) 3,200+/-830 ppm Dry wt	a) Sclerotic aorta from metal-workers b) Normal aorta from metal-workers c) Normal aorta from non metal-workers 45-66 yr old workers. Autopsies, Japan, 1976-1977. Employed 7-32 yr ES

AORTA; VERTEBRAE; BONES; ENVIRONMENTAL EXPOSURE; OCCUPATIONAL EXPOSURE; JAPAN; AUTOPSIES; CADAVERS; CARDIOVASCULAR DISEASES; MINERALS; BIOACCUMULATION; DIETS; FOODS; MINERAL DEPOSITS; CALCIUM; PHOSPHORUS; IRON; MAGNESIUM; ZINC; ALUMINUM; COPPER; CADMIUM; LEAD; NICKEL; VANADIUM; CHROMIUM; MANGANESE; SILICON; TIN; TITANIUM; STRONTIUM
Terasoka, H. 1984 Archives of Environmental Contamination and Toxicology 13:119-127

Tissue	Cases Exposure Route	Range	Mean	General Information
9634 Blood, plasma	14 Ingestion	a) Not given b) Not given c) Not given d) Not given e) Not given f) Not given g) Not given h) Not given	a) 2.06+/-0.13 mmol b) 1.32+/-0.12 mmol c) 1.46+/-0.12 mmol d) 1.29+/-0.16 mmol e) 2.18+/-0.14 mmol f) 2.13+/-0.19 mmol g) 2.53+/-0.11 mmol h) 2.24+/-0.03 mmol S.E.	a) Infants fed mothers' milk, start of study, 6 cases b) At 1 wk, 6 cases c) At 2 wk, 6 cases d) At 4 wk, 5 cases e) Infants fed formula, start of study, 5 cases f) At 1 wk, 5 cases g) At 2 wk, 5 cases h) At 4 wk (+ supplements NaHCO3, Ca-lactate), 5 cases Hypophosphatemia developed in infants fed mothers' milk. Significant difference between the two groups ($p<0.01$). Premature infants, birth wt <1.3 kg, mean gestation time 28 wk, Canada Colorimetry

PREMATURE INFANTS; CANADA; NUTRITIONAL DEFICIENCIES; BLOOD PLASMA; MILK; COMPARATIVE EVALUATIONS; CALCIUM; MAGNESIUM; MINERALS; PHOSPHORUS; POTASSIUM; SODIUM; FOODS; LACTATION; DELIBERATE EXPOSURE
Atkinson, S.A.; Radde, I.C.; Anderson, G.H. 1983 Journal of Pediatrics 102(1):99-106

Tissue	Cases Exposure Route	Range	Mean	General Information
9635 Blood, serum	24 Ingestion	Not given	4.02+/- 0.14 mg/dL S.E.	10% increase ($p<0.05$) 24 hr after 6 g dose of orotic acid. Level still within normal limits. Healthy 22-62 yr old, all university students and employees. HPLC

BLOOD SERUM; URINE; DELIBERATE EXPOSURE; ILLINOIS; ADULTS; COMPARATIVE EVALUATIONS; CHOLESTEROLS; PHOSPHORUS; METABOLITES
Robinson, J.L.; Dombrowski, D.B. 1983 Nutrition Research 3:407-415

Phosphorus
7723-14-0
P
AtW 30.97376, MP 44.1 C, BP 280 C, VP 10 mm Hg at 127 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9636 Bone	1	Not given	46000+/-14000 ppm Dry wt	Lumbar vertebrae (n=5). Chromate plating worker, employed 7 yr, died at age 66, 30 yr after changing jobs ES

AORTA; VERTEBRAE; BONES; ENVIRONMENTAL EXPOSURE; OCCUPATIONAL EXPOSURE; JAPAN; AUTOPSIES; CADAVERS; CARDIOVASCULAR DISEASES; MINERALS; BIOACCUMULATION; DIETS; FOODS; MINERAL DEPOSITS; CALCIUM; PHOSPHORUS; IRON; MAGNESIUM; ZINC; ALUMINUM; COPPER; CADMIUM; LEAD; NICKEL; VANADIUM; CHROMIUM; MANGANESE; SILICON; TIN; TITANIUM; STRONTIUM
Teraoka, H. 1984 Archives of Environmental Contamination and Toxicology 13:119-127

Tissue	Cases Exposure Route	Range	Mean	General Information
9637 Hair	a) 60 b) 51 c) 5 d) 15	a) Not given b) Not given c) Not given d) Not given	a) 124+/-1.8 ug/g b) 128+/-1.3 ug/g c) 167+/-1.2 ug/g d) 91+/-3.5 ug/g Geometric means	a) Total, unwashed hair samples b) Hair pieces c) Needle-pads d) Others (undefined) In unwashed samples, no significant difference between sample types or between dates of cutting (1880-1969). After washing (non-ionic SAA), levels significantly higher in 1911-1929 samples than in 1930-1983. Japanese women. 1981-1983 samples from 22 workers at National Institute of Environmental Studies Atomic emission spectrometry; AAS

HAIR; ENVIRONMENTAL EXPOSURE; JAPAN; COMPARATIVE EVALUATIONS; CALCIUM; COPPER; IRON; LEAD; MAGNESIUM; MANGANESE; MERCURY; MERCURY ORGANIC COMPOUNDS; METALS; MINERALS; PHOSPHORUS; POTASSIUM; SODIUM; STRONTIUM; TRACE ELEMENTS; ZINC; OCCUPATIONAL EXPOSURE
Suzuki, T.; Hongo, T.; Morita, M.; Yamamoto, R. 1984 Science of the Total Environment 39:81-91

Tissue	Cases Exposure Route	Range	Mean	General Information
9658 Milk	7	a) Not given b) Not given c) Not given	a) 4.84+/-0.52 mmol b) 5.13+/-0.29 mmol c) 5.06+/-0.61 mmol S.E.	a) 6-8 days postpartum b) 13-15 days postpartum c) 26-28 days postpartum Mothers of premature infants. Infant birth wt <1.3 kg, mean gestational age 28 wk, Canada Colorimetry

PREMATURE INFANTS; CANADA; NUTRITIONAL DEFICIENCIES; BLOOD PLASMA; MILK; COMPARATIVE EVALUATIONS; CALCIUM; MAGNESIUM; MINERALS; PHOSPHORUS; POTASSIUM; SODIUM; FOODS; LACTATION; DELIBERATE EXPOSURE
Atkinson, S.A.; Radde, I.C.; Anderson, G.H. 1983 Journal of Pediatrics 102(1):99-106

Phosphorus
7723-14-0
P
AtW 30.97376, MP 44.1 C, BP 280 C, VP 10 mm Hg at 127 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9639 Urine	a) 7 b) 7 c) 8 d) 8 e) 5 f) 8 Ingestion	a) Not given b) Not given c) Not given d) Not given e) Not given f) Not given	a) 643+/-18.9 mg/d b) 504+/-20.6 mg/d c) 336+/-32 mg/d d) 1539+/-50 mg/d e) 1394+/-52 mg/d f) 1075+/-75 mg/d	a) Low Ca intake, 230 mg/d b) Normal Ca intake, 831 mg/d c) High Ca intake, 1993 mg/d d) Low Ca intake, 230 mg/d e) Normal Ca intake 831 mg/d f) High Ca intake, 1993 mg/d Normal P intake, 797 mg/d, a)-c). High P intake, 1993 mg/d, d)-f). Pooled from 6 6-day study periods. Increasing Ca intake significantly decreases urinary P. Additional data available. 37-71 yr old ambulatory patients, good physical condition, research ward, controlled diets, Illinois AAS
URINE; DELIBERATE EXPOSURE; ILLINOIS; PHOSPHORUS; CALCIUM; METABOLISM; MINERAL METABOLISM Spencer, H.; Kramer, L.; Osis, D. 1984 American Journal of Clinical Nutrition 40:219-225				

Phosphorus, isotope of mass 32
14596-37-3
P

Tissue	Cases Exposure Route	Range	Mean	General Information
9640 Urine	2 Ingestion	a) 200-25 dpm b) 700-300 dpm	a) Not applicable b) Not applicable	a) 1-19 d, individual B, after calculated dose of 8-14 u Ci b) 1-19 d, individual A, after calculated dose of 47-77 u Ci. Peak (12,500 dpm) occured 10 d prior to data report. Laboratory workers contaminated with P-32 Scintillation counting
URINE; CONSUMER EXPOSURE; ADULTS; OCCUPATIONAL DISEASES; PHOSPHORUS; BIOACCUMULATION; BIOLOGICAL MONITORING; INDUSTRIAL ACCIDENTS; HEALTH HAZARDS; FOOD CONTAMINATION; IRRADIATION; OCCUPATIONAL HAZARDS; RADIATION DOSES; RADIONUCLIDES Dettman, G.L. 1984 Health Physics 46(1):209-211				

Phthalic acid, bis(2-ethylhexyl) ester (8 CI); 1,2-Benzenedicarboxylic acid, bis(2-ethylhexyl) ester (9 CI)
117-81-7
C24-H38-O4
MW 390.54

Tissue	Cases Exposure Route	Range	Mean	General Information
9641 Blood				Review. General information, reported levels, sources of exposure, metabolites, and methods of analysis for: phthalate ester plasticisers, chlorophenoxy acid herbicides, chlorophenol biocides, p-nitrophenol, simple phenols, benzenediols, and toluene.
9642 Urine				Review. General information, reported levels, sources of exposure, metabolites, and methods of analysis for: phthalate ester plasticisers, chlorophenoxy acid herbicides, chlorophenol biocides, p-nitrophenol, simple phenols, benzenediols, and toluene.
URINE; ENVIRONMENTAL EXPOSURE; OCCUPATIONAL EXPOSURE; DELIBERATE EXPOSURE; CONSUMER EXPOSURE; ADULTS; REVIEW; CARCINOMAS; POISONING; MEASUREMENT METHODS; PESTICIDES; INDUSTRIAL CHEMICALS; HERBICIDES; INSECTICIDES; FUNGICIDES; PENTACHLOROPHENOL; SOLVENTS; BENZENES; PHENOLS; INDUSTRIAL POLLUTION; TOLUENE; BLOOD; CARCINOGEN; METABOLISM; METABOLITES; WOOD PRESERVATIVES Fatiadi, A.J. 1983 Priority Toxic Pollutants in Human Urine: Their Occurrence and Analysis, Aug. 1983, 60 p				

Phthalic acid, diethyl ester (8 CI); 1,2-Benzenedicarboxylic acid, diethyl ester (9 CI)
84-66-2
C12-H14-O4
MW 222.23, MP -40.5 C, BP 295 C, VP 14 mm Hg at 163 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9643 Urine				Review. General information, reported levels, sources of exposure, metabolites, and methods of analysis for: phthalate ester plasticisers, chlorophenoxy acid herbicides, chlorophenol biocides, p-nitrophenol, simple phenols, benzenediols, and toluene.
URINE; ENVIRONMENTAL EXPOSURE; OCCUPATIONAL EXPOSURE; DELIBERATE EXPOSURE; CONSUMER EXPOSURE; ADULTS; REVIEW; CARCINOMAS; POISONING; MEASUREMENT METHODS; PESTICIDES; INDUSTRIAL CHEMICALS; HERBICIDES; INSECTICIDES; FUNGICIDES; PENTACHLOROPHENOL; SOLVENTS; BENZENES; PHENOLS; INDUSTRIAL POLLUTION; TOLUENE; BLOOD; CARCINOGEN; METABOLISM; METABOLITES; WOOD PRESERVATIVES Fatiadi, A.J. 1983 Priority Toxic Pollutants in Human Urine: Their Occurrence and Analysis, Aug. 1983, 60 p				

Picolinic acid, 4-amino-3,5,6-trichloro- (8 CI); 2-Pyridinecarboxylic acid, 4-amino-3,5,6-trichloro- (9 CI)
1918-02-1
C6-H3-Cl3-N2-O2
MW 241.48, MP 218-219 C, VP 6.16X10(E-7) mm Hg at 35 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9644 Blood	6 Ingestion	a) 0.33-0.03 ug/ml b) 3.6-0.018 ug/ml	a) Not given b) Not given	a) 1 and 4 hr after 0.5 mg/kg b) 1 and 12 hr after 5 mg/kg Oral doses administered 2 wk apart. No adverse effects. No measurable quantities (>10 ng/ml) after 2.0 mg/kg dermal dose. 40-51 yr old employee volunteers, Dow Chemical Company, Midland, Michigan GC/MS

(next page)

Picolinic acid, 4-amino-3,5,6-trichloro- (8 CI); 2-Pyridinecarboxylic acid, 4-amino-3,5,6-trichloro- (9 CI)
1918-02-1
C6-H3-Cl3-N2-O2
MW 241.48, MP 218-219 C, VP 6.16X10(E-7) mm Hg at 35 C

(continued)

Tissue	Cases Exposure Route	Range	Mean	General Information
9645 Urine	6 Ingestion Dermal	a) Not given b) Not given c) Not given d) Not given e) Not given	a) 86.2% b) 76.7% c) 93.8% d) 87.8% e) 0.18% % of dose	a) Total for 6 hr after 5.0 mg/kg, oral b) Total for 6 hr after 0.5 mg/kg, oral c) Total for 72 hr after 5.0 mg/kg, oral d) Total for 72 hr after 0.5 mg/kg, oral e) Total for 72 hr after 2 mg/kg, dermal. Doses administered 2 wk apart. No adverse effects. 40-51 yr old employee volunteers, Dow Chemical Company, Midland, Michigan GC/MS
BLOOD; URINE; DELIBERATE EXPOSURE; MICHIGAN; ADULTS; HERBICIDES Nolan, R.J.; Freshour, N.L.; Kastl, P.E.; Saunders, J.H. 1984 Toxicology and Applied Pharmacology 76:264-269				

Tissue	Cases Exposure Route	Range	Mean	General Information
9646 Urine	a) 7 b) 5 c) 6 d) 3 e) 3 Dermal Inhalation	a) <0.01-5.56 mg/kg b) <0.01-2.27 mg/kg c) <0.01-0.44 mg/kg d) 0.01-0.17 mg/kg e) 0.04-0.63 mg/kg	a) 0.52 mg/kg b) 0.26 mg/kg c) 0.14 mg/kg d) 0.07 mg/kg e) 0.27 mg/kg	a) Spray gun, rights-of-way, Kapuskasing, 1979 b) Spray gun, rights-of-way, North Bay, 1979 c) Spray gun, roadside, 2 locations, 1980 d) Spray gun, rights-of-way, 1 location, 1980 e) Mist blower, rights-of-way, 1 location, 1980 Adult herbicide applicators performing spray operations in Ontario. Workers used improved safety precautions, in 1980. GC
URINE; SKIN; LUNGS; OCCUPATIONAL EXPOSURE; CANADA; ADULTS; INDUSTRIAL HYGIENE; HERBICIDES; HEALTH HAZARDS; INHALATION; OCCUPATIONAL HAZARDS Libich, S.; To, J.C.; Frank, R.; Sirons, G.J. 1984 American Industrial Hygiene Association Journal 45(1):56-62				

Platinum

7440-06-4
Pt
AtW 195.09, MP 1775.5 C, BP 3827 C, VP 1 mm Hg at 2600 C, 10 mm Hg at 2940 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9647 Urine	a) 7 b) 10 c) 5	a) 2.6-15 ng/ml b) 0.6-23.1 ng/ml c) 4100-11,300 ng/ml	a) 8.9 ng/ml b) 10.22 ng/ml c) 7060 ng/ml	a) Office workers - controls b) Pharmacists, nurses handling Pt-containing drugs during study week c) Positive controls - patients treated with last cisplatic 4-6 hr before sampling (doses were 30-40 mg/d, 5 d plus other drugs) Methodology for monitoring cytotoxic Pt-containing drugs. "Exposed": 2 pharmacists, 8 nurses, (mean age 28.4 yr). Controls: 9 office workers (mean age 27.3 yr), 5 patients (mean age 31.2 yr) on chemotherapy for testicular carcinoma. AAS
ENVIRONMENTAL EXPOSURE; PLATINUM; CYTOTOXICITY; URINE Venitt, S.; Crofton-Sleigh, C.; Hunt, J.; Speechley, V.; Brigge, K. 1984 Lancet 1(8368):74-76				

Plutonium

7440-07-5
Pu
AtW 242, 244 (most stable known isotopes), MP 639.5 C (also reported as 641 C), BP 3232 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9648 Bone	a) 59 b) 110	a) 0.15-0.99+% b) 0.35-0.99+%	a) 0.61+/-1.5% b) 0.76+/-1.4%	a) Occupational accidents, fraction in skeleton b) Non-occupational fallout, fraction in skeleton Geometric mean for combined data was 70% in skeleton, 30% in liver after exposure. 3% uptake in spleen, lung, and kidney, and <1% excreted. Emphasized these were population figures. Individual levels can vary. Autopsy cases
BONES; ENVIRONMENTAL EXPOSURE; OCCUPATIONAL EXPOSURE; UNITED STATES; AUTOPSIES; PLUTONIUM; BIOACCUMULATION; RADIATION DOSES; RADIOISOTOPES; OCCUPATIONAL HAZARDS Thomas, R.G.; Healy, J.W.; McInroy, J.F. 1984 Health Physics 46(4):839-844				

Tissue	Cases Exposure Route	Range	Mean	General Information
9649 Bone	1 Inhalation		7.7 Bq	Sample used in estimating body burden of 190 Bq (systemic burden of 110 Bq). Man, not a worker, exposed 9/9/70 at Karlsruhe Nuclear Research Center. Death 12 yr later
9650 Liver	1 Inhalation		58 Bq	Man, not a worker, exposed 9/9/70 at Karlsruhe Nuclear Research Center. Death 12 yr later
9651 Lung	1 Inhalation		54 Bq	Man, not a worker, exposed 9/9/70 at Karlsruhe Nuclear Research Center. Death 12 yr later
9652 Spleen	1 Inhalation		0.7 Bq	Man, not a worker, exposed 9/9/70 at Karlsruhe Nuclear Research Center. Death 12 yr later

(next page)

Plutonium
7440-07-5
Pu
AtW 242, 244 (most stable known isotopes), MP 639.5 C (also reported as 641 C), BP 3232 C

(continued)

Tissue	Cases Exposure Route	Range	Mean	General Information
9658 Thyroid gland	1 Inhalation		0.02 Bq	Man, not a worker, exposed 9/9/70 at Karlsruhe Nuclear Research Center. Death 12 yr later

PLUTONIUM; AUTOPSIES; SPLEEN; THYROID GLANDS; BLOOD; LUNGS; LIVER; BONE; MODELS; INHALATION; RADIONUCLIDES; OCCUPATIONAL EXPOSURE; GERMANY; AIR POLLUTION
Ohlenschlaeger, L.; Schleferdecker, H.; Schmidt-Martin, W. 1984 Health Physics 46(4):833-836

Polybrominated biphenyls (No postings in CHEMLINE).

Tissue	Cases Exposure Route	Range	Mean	General Information
9654 Adipose	a) 32 b) 56 c) 29 e) 83	a) None detected-174,000 ug/kg b) None detected-619 ug/kg c) 400-350,500 ug/kg d) 70,000-350,000 ug/kg	a) 330 ug/kg b) 570 ug/kg c) 5,290 ug/kg d) 1,650 ug/kg e) Geometric means	a) Pregnant females b) Nonpregnant females c) Male chemical workers d) Farmers and other male workers Correlated with serum levels Residents, MI GC

MICHIGAN; ADULTS; ADIPOSE TISSUE; BILE; BLOOD SERUM; MILK; PLACENTA; COMPARATIVE EVALUATIONS; POLYBROMINATED BIPHENYLS; ACCIDENTAL POISONING; BIOACCUMULATION ; FARMS; FOOD CONTAMINATION; LACTATION; OCCUPATIONAL HAZARDS; POPULATION EXPOSURE; PREGNANCY; ENVIRONMENTAL EXPOSURE
Eyster, J.T.; Humphrey, H.E.B.; Kimbrough, R.D. 1983 Archives of Environmental Health 38(1):47-53

Tissue	Cases Exposure Route	Range	Mean	General Information
9655 Adipose	a) 10 b) 9 Ingestion	a) 20.960-0.116 ppm b) 0.074-0.010 ppm	a) 4.218+/-6.710 ppm b) 0.030+/-0.019 ppm	a) High exposure (>0.100 ppm) b) Low exposure (<0.100 ppm) Significant inverse correlation ($p<0.05$) between levels and scores on 4 of 5 developmental abilities tests. Children, 2 yr 5 mo to 3 yr 11 mo old, exposed in utero or in infancy, MI

MICHIGAN; CHILDREN; ADIPOSE TISSUE; BIOPSIES; POLYBROMINATED BIPHENYLS; ACCIDENTAL POISONING; BIOACCUMULATION; FOOD CONTAMINATION; LACTATION; PREGNANCY
Seagull, E.A.W. 1983 American Journal of Public Health 73(3):281-285

Polybrominated biphenyls (No postings in CHEMLINE).

Tissue	Cases Exposure Route	Range	Mean	General Information
9656 Bile	20	None detected-70 ug/l	2.7 ug/l Geometric mean	Farm and chemical workers. Correlated with serum levels. Residents, MI GC

MICHIGAN; ADULTS; ADIPOSE TISSUE; BILE; BLOOD SERUM; MILK; PLACENTA; COMPARATIVE EVALUATIONS; POLYBROMINATED BIPHENYLS; ACCIDENTAL POISONING; BIOACCUMULATION ; FARMS; FOOD CONTAMINATION; LACTATION; OCCUPATIONAL HAZARDS; POPULATION EXPOSURE; PREGNANCY; ENVIRONMENTAL EXPOSURE

Eyster, J.T.; Humphrey, H.E.B.; Kimbrough, R.D. 1983 Archives of Environmental Health 38(1):47-53

Tissue	Cases Exposure Route	Range	Mean	General Information
9657 Blood, serum	Ingestion	a) 0.0-0.7 ng/mL b) 0.0-1.7 ng/mL	a) 1.7 ng/mL b) 0.3 ng/mL	a) Maternal serum, 205 cases b) Cord serum, 230 cases Significant transfer to fetus. Mothers residing in sites of 1973 PBB incident in Michigan GC

BLOOD SERUM; MILK; PLACENTA; ENVIRONMENTAL EXPOSURE; MICHIGAN; POLYCHLORINATED BIPHENYLS; POLYBROMINATED BIPHENYLS; LACTATION; TRANSPLACENTAL TRANSFER; BIOACCUMULATION

Jacobson, J.L.; Fein, G.G.; Jacobson, S.W.; Schwartz, P.M.; Dowler, J.K. 1984 American Journal of Public Health 74:378-379

Tissue	Cases Exposure Route	Range	Mean	General Information
9656 Blood, serum	a) 61 b) 60 c) 56 d) 20 e) 85	a) None detected-1,068 ug/l b) None detected-104 ug/l c) None detected-873 ug/l d) 1-1,200 ug/l e) None detected-1,515 ug/l	a) 3.5 ug/l b) Not given (median <1 ug/l) c) 3.1 ug/l d) 26.4 ug/l e) 5.4 ug/l Geometric means	a) Pregnant females b) Cord blood c) Nonpregnant females d) Male chemical workers e) Farmers and other male workers Levels in maternal serum correlated with levels in placenta, cord blood, and maternal adipose. Levels in nonpregnant females, chemical workers, and farmers also correlated with levels in adipose. tissue. Residents, MI GC

MICHIGAN; ADULTS; ADIPOSE TISSUE; BILE; BLOOD SERUM; MILK; PLACENTA; COMPARATIVE EVALUATIONS; POLYBROMINATED BIPHENYLS; ACCIDENTAL POISONING; BIOACCUMULATION ; FARMS; FOOD CONTAMINATION; LACTATION; OCCUPATIONAL HAZARDS; POPULATION EXPOSURE; PREGNANCY; ENVIRONMENTAL EXPOSURE

Eyster, J.T.; Humphrey, H.E.B.; Kimbrough, R.D. 1983 Archives of Environmental Health 38(1):47-53

Polybrominated biphenyls (No postings in CHEMLINE).

Tissue	Cases Exposure Route	Range	Mean	General Information
9459 Milk	136 Ingestion	0.0-23.0 ng/mL	3.6 ng/mL	Higher fat content than serum may account for higher levels. Significant transfer to milk. Mothers residing in sites of 1973 PBB incident in Michigan GC

BLOOD SERUM; MILK; PLACENTA; ENVIRONMENTAL EXPOSURE; MICHIGAN; POLYCHLORINATED BIPHENYLS; POLYBROMINATED BIPHENYLS; LACTATION; TRANSPLACENTAL TRANSFER; BIOACCUMULATION

Jacobson, J.L.; Fein, G.G.; Jacobson, S.W.; Schwartz, P.M.; Dowler, J.K. 1984 American Journal of Public Health 74:378-379

Tissue	Cases Exposure Route	Range	Mean	General Information
9460 Milk				Review. Levels after occupational exposures to trace metals, solvents, and halogenated hydrocarbons, discussed in terms of milk partition factors, potential infant exposures, possible health effects.

MILK; ENVIRONMENTAL EXPOSURE; ADULTS; REVIEW; MERCURY; LEAD; DDT; DIELDRIN; POLYCHLORINATED BIPHENYLS; POLYBROMINATED BIPHENYLS; CHROMIUM; CADMIUM; HEPTACHLOR EPOXIDE; OXYCHLORDANE; BIOACCUMULATION; LACTATION; HEALTH HAZARDS

Wolff, M.S. 1983 American Journal of Industrial Medicine 4:259-281

Tissue	Cases Exposure Route	Range	Mean	General Information
9461 Milk	2986 Ingestion	Not detectable-2 ppm	0.097 ppm	Samples collected 5/76-12/78 after major contamination of livestock feed in 1973 and subsequent contamination of human food. Highest levels from areas nearest original spill. 17 to 44 yr old (mean 28 yr) lactating volunteers residing a minimum of 1 year in Michigan

MICHIGAN; CONSUMER EXPOSURE; ENVIRONMENTAL EXPOSURE; MILK; BIOLOGICAL MONITORING; POLYBROMINATED BIPHENYLS; LACTATION; BIOACCUMULATION; ACCIDENTAL POISONING; FOOD CONTAMINATION

Miller, P.D.; Brilliant, L.B.; Copeland, R. 1984 Bulletin of Environmental Contamination and Toxicology 32:128-133

Tissue	Cases Exposure Route	Range	Mean	General Information
9462 Milk	47	None detected-92,667 ug/kg	312.4 ug/kg Geometric mean	Lipid basis 3-5 days after parturition Correlation with levels in maternal serum and adipose. Residents, MI
9463 Placenta	61	<1-370 ug/kg	<1 ug/kg Median	Significant correlation with maternal serum levels Parturient women, MI

MICHIGAN; ADULTS; ADIPOSE TISSUE; BILE; BLOOD SERUM; MILK; PLACENTA; COMPARATIVE EVALUATIONS; POLYBROMINATED BIPHENYLS; ACCIDENTAL POISONING; BIOACCUMULATION ; FARMS; FOOD CONTAMINATION; LACTATION; OCCUPATIONAL HAZARDS; POPULATION EXPOSURE; PREGNANCY; ENVIRONMENTAL EXPOSURE

Eyster, J.T.; Humphrey, H.E.B.; Kimbrough, R.D. 1983 Archives of Environmental Health 38(1):47-53

Polychlorinated dibenzofurans (No postings in CHEMLINE).

Tissue	Cases Exposure Route	Range	Mean	General Information
9664 Adipose				Review of the relative toxicity of the individual congeners of PCBs and PCDFs identified in tissues of Yusho patients.

REVIEW; POLYCHLORINATED BIPHENYLS; ENVIRONMENTAL EXPOSURE; POLYCHLORINATED DIBENZOFURANS; ADIPOSE TISSUE; BLOOD; LIVER; JAPAN; TAIWAN
Masuda, Y.; Yoshimura, H. 1984 American Journal of Industrial Medicine 5:31-44

Tissue	Cases Exposure Route	Range	Mean	General Information
9665 Blood				Review of occupational exposure of workers to PCBs, PCQs, and PCDFs. Health status and blood levels of exposed workers were compared with those of Yusho patients.

REVIEW; OCCUPATIONAL EXPOSURE; POLYCHLORINATED BIPHENYLS; POLYCHLORINATED QUARTERPHENYLS; BLOOD; BLOOD PLASMA; CHILDREN; ADULTS; ENVIRONMENTAL EXPOSURE; COMPARATIVE EVALUATIONS; POLYCHLORINATED DIBENZOFURANS
Takamatsu, M.; Oki, M.; Maeda, K.; Inoue, Y.; Hirayama, H.; Yoshizuka, K. 1984 American Journal of Industrial Medicine 5:59-68

Tissue	Cases Exposure Route	Range	Mean	General Information
9666 Blood	255 Ingestion Dermal Inhalation	a) Not given b) Not given c) Not given d) Not given e) Not given f) Not given g) Not given	a) 0.076+/-0.036 ppb b) 0.01 ppb c) <0.01 ppb d) <0.01 ppb e) <0.01 ppb f) 0.111+/-0.050 ppb g) 0.047+/-0.019 ppb	a) 67 Taiwanese, ate contaminated rice oil, 1 yr post-exposure b) 56 Japanese ate contaminated rice oil, 11 yr post-exposure c) 69 Japanese workers charging condensers d) 3 Japanese workers reclaiming PCBs used as heat exchangers e) 60 unexposed Japanese f) 6 Taiwanese females, 0.5 yr post-exposure Exposures to PCB's. Severity of lesions proportional to levels PCDF's contaminating PCB's. PCDF's apparent causal agents of severe clinical manifestations of Yusho. Taiwanese students, sampled 1979-81. Japanese victims of Yusho, sampled 1979. Japanese occupationally exposed in factories, sampled 1979-81. Unexposed healthy Japanese, sampled 1979-80 Contaminated rice oil disease or Yusho-type lesions. GC; GC/MS

TAIWAN; JAPAN; ACCIDENTAL POISONING; ENVIRONMENTAL EXPOSURE; OCCUPATIONAL EXPOSURE; HEALTH HAZARDS; FOOD CONTAMINATION; BLOOD; POLYCHLORINATED BIPHENYLS; CHLORINATED HYDROCARBONS; COMPARATIVE EVALUATIONS; POLYCHLORINATED QUARTERPHENYLS; POPULATION EXPOSURE; INDUSTRIAL CHEMICALS
Kunita, N.; Kashimoto, T.; Miyata, H.; Fukushima, S.; Hori, S.; Obana, H. 1984 American Journal of Industrial Medicine 5:45-58

Tissue	Cases Exposure Route	Range	Mean	General Information
9667 Liver				Review of the relative toxicity of the individual congeners of PCBs and PCDFs identified in tissues of Yusho patients.

REVIEW; POLYCHLORINATED BIPHENYLS; ENVIRONMENTAL EXPOSURE; POLYCHLORINATED DIBENZOFURANS; ADIPOSE TISSUE; BLOOD; LIVER; JAPAN; TAIWAN
Masuda, Y.; Yoshimura, H. 1984 American Journal of Industrial Medicine 5:31-44

Polychlorinated quarterphenyls (No postings in CHEMLINE).

Tissue	Cases Exposure Route	Range	Mean	General Information
9668 Blood				Review of occupational exposure of workers to PCBs, PCQs, and PCDFs. Health status and blood levels of exposed workers were compared with those of Yusho patients.

REVIEW; OCCUPATIONAL EXPOSURE; POLYCHLORINATED BIPHENYLS; POLYCHLORINATED QUARTERPHENYLS; BLOOD; BLOOD PLASMA; CHILDREN; ADULTS; ENVIRONMENTAL EXPOSURE; COMPARATIVE EVALUATIONS; POLYCHLORINATED DIBENZOFURANS

Takamatsu, M.; Oki, M.; Maeda, K.; Inoue, Y.; Hirayama, H.; Yoshisuke, K. 1984 American Journal of Industrial Medicine 5:59-68

Tissue	Cases Exposure Route	Range	Mean	General Information
9669 Blood	255 Ingestion Dermal Inhalation	a) Not given b) Not given c) Not given d) Not given e) Not given f) Not given g) Not given	a) 8.6+/-4.8 ppb b) 2.0+/-2.0 ppb c) <0.02 ppb d) 0.9+/-0.9 ppb e) <0.02 ppb f) 9.6+/-3.7 ppb g) 3.5+/-2.5 ppb	a) 67 Taiwanese, consumed PCB contaminated rice oil, 1 yr post exposure b) 56 Japanese consumed PCB contaminated rice oil, 11 yr post exposure c) 60 Japanese workers charging PCBs into condensers in factory d) 3 Japanese workers reclaiming PCBs used as heat exchangers e) 60 Japanese unexposed to PCBs f) 6 Taiwanese females, 0.5 yr post PCB exposure g) Same 6 Taiwanese females, 2 yr post exposure PCQs contamination of PCBs did not appear to cause clinical manifestations associated with PCB poisoning. Taiwanese students, sampled 1979-81. Japanse victims of Yusho, sampled 1979. Japanese occupationally exposed in factories, sampled 1979-81. Unexposed healthy Japanese, sampled 1979-80 Contaminated rice oil disease or Yusho-type lesions. GC; GC/MS

TAIWAN; JAPAN; ACCIDENTAL POISONING; ENVIRONMENTAL EXPOSURE; OCCUPATIONAL EXPOSURE; HEALTH HAZARDS; FOOD CONTAMINATION; BLOOD; POLYCHLORINATED BIPHENYLS; CHLORINATED HYDROCARBONS; COMPARATIVE EVALUATIONS; POLYCHLORINATED QUARTERPHENYLS; POPULATION EXPOSURE; INDUSTRIAL CHEMICALS

Kunita, N.; Kashimoto, T.; Miyata, H.; Fukushima, S.; Hori, S.; Obana, H. 1984 American Journal of Industrial Medicine 5:45-58

Tissue	Cases Exposure Route	Range	Mean	General Information
9670 Blood				Review of clinical signs and symptoms of Yusho patients in Japan 1968-1978.

POLYCHLORINATED BIPHENYLS; POLYCHLORINATED QUARTERPHENYLS; ACCIDENTAL POISONING; REVIEW; JAPAN; BLOOD; ENVIRONMENTAL EXPOSURE

Okumura, M. 1984 American Journal of Industrial Medicine 5:13-16

Porphyrin, total (No postings in CHEMLINE).

Tissue	Cases Exposure Route	Range	Mean	General Information
9671 Urine	78	a) 21-161 ug/l b) Not given c) Not given d) Not given e) Not given f) Not given	a) 91.2+/-34.8 ug/l b) 75.8+/-8.2% c) 2.4+/-0.7% d) 1.2+/-0.6% e) 4.9+/-2.0% f) 15.7+/-6.2%	a) 20 ml spot sample, total porphyrins, range of peaks b) 4-COOH homologue c) 5-COOH homologue d) 6-COOH homologue e) 7-homologue f) 8-homologue % total. Sensitive and rapid assay. Healthy volunteers, factory or power station workers, 20-56 yr old HPLC
URINE; ITALY; ADULTS; LIVER DISEASES; OCCUPATIONAL DISEASES; INDUSTRIAL MEDICINE; MEASUREMENT METHODS; PORPHYRINS; BIOACCUMULATION; BIOLOGICAL MONITORING; HEALTH HAZARDS; INDUSTRIAL ATMOSPHERES; INDUSTRIAL PLANTS Colombi, A.; Maroni, M.; Perioli, A.; Valla, C.; Coletti, G.; Foa, V. 1983 American Journal of Industrial Medicine 4:551-564				

Potassium
7440-09-7
K
AtW 39.098, MP 63.2 C, BP 765.5 C, VP 100 mm Hg at 590 C

Tissue	Cases Exposure Route	Range	Mean	General Information
8672 Blood, plasma	1 Injection	1.5-6.2 umol/l	Not given	10-114 hr after ingesting 40 g barium carbonate. Therapy with 254 mmol K, iv at 10-60 hr. Peak at 57 hr. Range of means estimated from graph 39 yr old woman Result of barium poisoning: abdominal pain, diarrhea, vomiting, muscle weakness, respiratory failure, paralysis, hypokalemia, renal insufficiency Vastus medialis muscle, mild, non-specific atrophy. During paralysis muscle electrically silent, unexcitable, nerve action potentials. Recovery - low amplitude, short "myopathic" units
BLOOD PLASMA; DELIBERATE EXPOSURE; CASE HISTORIES; SUICIDE; BARIUM; POTASSIUM Phelan, D.M.; Hagley, S.R.; Guerin, M.D. 1984 British Medical Journal 289:882				

Potassium
7440-09-7
K
AtW 39.098, MP 63.2 C, BP 765.5 C, VP 100 mm Hg at 590 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9675 Blood, plasma	14 Ingestion	a) Not given b) Not given c) Not given d) Not given e) Not given f) Not given g) Not given h) Not given	a) 5.0+/-0.4 mmol b) 4.6+/-0.1 mmol c) 4.7+/-0.2 mmol d) 4.8+/-0.3 mmol e) 5.3+/-0.4 mmol f) 5.3+/-0.4 mmo g) 5.8+/-0.2 mmol h) 4.8+/-0.2 mmol S.E.	a) Infant fed mothers' milk, start of study, 7 cases b) At 1 wk, 7 cases c) At 2 wk, 7 cases d) At 4 wk, 5 cases e) Infants fed formula, start of study, 5 cases f) At 1 wk, 7 cases g) At 2 wk, 6 cases h) At 4 wk (+ supplements NaHCO3, Ca-lactate), 5 cases Levels significantly higher in formula fed infants ($p<0.05$). Mild hyperkalemia (plasma K >5.5 mmol/l) observed in formula fed infants at 2nd wk only. Premature infants, birth wt <1.8 kg, mean gestational age 28 wk, Canada Flame photometry

PREMATURE INFANTS; CANADA; NUTRITIONAL DEFICIENCIES; BLOOD PLASMA; MILK; COMPARATIVE EVALUATIONS; CALCIUM; MAGNESIUM; MINERALS; PHOSPHORUS; POTASSIUM; SODIUM; FOODS; LACTATION; DELIBERATE EXPOSURE

Atkinson, S.A.; Radde, I.C.; Anderson, G.H. 1983 Journal of Pediatrics 102(1):99-106

Tissue	Cases Exposure Route	Range	Mean	General Information
9674 Blood, serum	a) 74 b) 14 c) 4 Ingestion	a) =/>3.5 mmol/L b) 3.0-3.4 mmol/L c) <3.0 mmol/L	a) Not given b) Not given c) Not given	a) 45, cardiac arrhythmia within 48 hr, 31 had none. Considered normal level of K b) 10, cardiac arrhythmia within 48 hr, 4 had none c) 3, cardiac arrhythmia within 48 hr, 1 had none Measured at admission. Significant correlation between K and Mg levels whether patient receiving diuretics or not. No strong predictive relationship between mildly decreased K levels (resulting from diuretics) and onset of arrhythmia. Patients in University of Virginia Medical Center Coronary Care Unit ISE

BLOOD SERUM; VIRGINIA; HEART DISEASES; COMPARATIVE EVALUATIONS; MAGNESIUM; POTASSIUM

Boyd, J.C.; Bruns, D.E.; DiMarco, J.P.; Sugg, N.K.; Wills, M.R. 1984 Clinical Chemistry 30(5):754-757

Tissue	Cases Exposure Route	Range	Mean	General Information
9675 Blood, serum	a) 50 b) 159	a) Not given b) 4.2+/-1.7-4.8+/-1.6 mmol/L S.E.	a) 5.4+/-0.7 mmol/L b) Not given S.E.	a) Controls b) Patients with ischemic heart disease and hypertension Range of means. Controls from group of 30-56 yr olds (42 males, 8 females), 24% with family history of ischemic heart disease. 30-80 yr old patients (138 males, 21 females), 62% smokers, 27% with similar family history Flame photometry

BLOOD SERUM; HEART DISEASES; HYPERTENSION; TRACE ELEMENTS; COPPER; ZINC; IRON; NICKEL; COBALT; SODIUM; POTASSIUM; CALCIUM; MAGNESIUM; PAKISTAN; COMPARATIVE EVALUATIONS; CHOLESTEROLS

Khan, S.N.; Rahman, M.A.; Samad, A. 1984 Clinical Chemistry 30(5):644-648

Potassium
7440-09-7
K
AtW 39.098, MP 63.2 C, BP 765.5 C, VP 100 mm Hg at 590 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9676 Blood, serum	1	Not applicable	5.4 mmol (mEq) /L	Third postoperative day. Ovarian tumor ruptured during removal. Peritoneal lavage with 500 ml 1/500 HgCl2. Thoroughly removed after 5 min. Cites 10 toxic reactions including 5 deaths related to peritoneal lavage. 53 yr old cancer surgery patient Ascites, anuria, pulmonary edema, respiratory distress syndrome. Morphological changes in lungs, kidneys, colon, and peritoneal cavity. Histological confirmation of respiratory distress syndrome, necrotising colitis and acute renal tubular necrosis

BLOOD; HEART; KIDNEYS; LUNGS; LIVER; DELIBERATE EXPOSURE, CASE HISTORIES; METAL POISONING; NEOPLASMS; LAVAGE; MERCURY; POTASSIUM
Laundy, T.; Adam, A.E.; Kershaw, J.B.; Rainford, D.J. 1984 British Medical Journal 289:96-96

Tissue	Cases Exposure Route	Range	Mean	General Information
9677 Blood, serum	16	a) 3.6-4.9 mmol/l b) 3.5-4.8 mmol/l	a) 4.3 mmol/l b) About 4.1 mmol/l	a) During treatment with 500-1000 mg acetazolamide and 8-16 mmol K/d b) 1-4 mo after stopping K supplements, still receiving acetazolamide Levels not significantly different. Values estimated from figure. Glaucoma patients, mean age 64.3+/-12.1, United Kingdom

BLOOD SERUM; UNITED KINGDOM; DISEASES; DIURETICS; POTASSIUM; METABOLISM
Critchlow, A.S.; Freeborn, S.P.; Roddie, R.A. 1984 British Medical Journal 289:21

Tissue	Cases Exposure Route	Range	Mean	General Information
9678 Hair	61	11-240 ppm	71.5 ppm	Pottery workers. Values not given for controls Tlaquepaque and Tonala, Mexico NA

HAIR; OCCUPATIONAL EXPOSURE; ARIZONA; MEXICO; ADULTS; LEAD; CADMIUM; ARSENIC; VANADIUM; GOLD; ZINC; COPPER; IRON; MANGANESE; POTASSIUM
Weber, C.W.; Nelson, G.W.; deVaquera, M.V.; Pearson, P.B. 1984 Nutrition Reports International 30(5):1009-1018

Potassium
7440-09-7
K
AtW 39.098, MP 63.2 C, BP 765.5 C, VP 100 mm Hg at 590 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9670 Hair	a) 60 b) 51 c) 5 d) 15	a) Not given b) Not given c) Not given d) Not given	a) 233+/-3.4 ug/g b) 220+/-2.8 ug/g c) 629+/-1.8 ug/g d) 202+/-6.6 ug/g Geometric means	a) Total, unwashed hair samples b) Hair pieces c) Needle-pads d) Others (undefined) In unwashed samples, no significant difference between sample types or dates of cutting (1880-1960). After washing (non-ionic surface active agent), levels significantly lower in 1911-1968 samples than in 1961-1985. Japanese women. 1961-1985 samples from 22 workers at National Institute of Environmental Studies Atomic emission spectrometry; AAS

HAIR; ENVIRONMENTAL EXPOSURE; JAPAN; COMPARATIVE EVALUATIONS; CALCIUM; COPPER; IRON; LEAD; MAGNESIUM; MANGANESE; MERCURY; MERCURY ORGANIC COMPOUNDS; METALS; MINERALS; PHOSPHORUS; POTASSIUM; SODIUM; STRONTIUM; TRACE ELEMENTS; ZINC; OCCUPATIONAL EXPOSURE
Suzuki, T.; Hongo, T.; Morita, M.; Yamamoto, R. 1984 Science of the Total Environment 39:81-91

Tissue	Cases Exposure Route	Range	Mean	General Information
9680 Milk	7	a) Not given b) Not given c) Not given	a) 17.8+/-0.90 mmol b) 16.0+/-0.50 mmol c) 14.7+/-0.80 mmol S.E.	a) 6-8 days postpartum b) 13-15 days postpartum c) 26-28 days postpartum Mothers of premature infants. Infant birth wt <1.8 kg, mean gestational age 28 wk, Canada Flame photometry

PREMATURE INFANTS; CANADA; NUTRITIONAL DEFICIENCIES; BLOOD PLASMA; MILK; COMPARATIVE EVALUATIONS; CALCIUM; MAGNESIUM; MINERALS; PHOSPHORUS; POTASSIUM; SODIUM; FOODS; LACTATION; DELIBERATE EXPOSURE
Atkinson, S.A.; Radde, I.C.; Anderson, G.H. 1983 Journal of Pediatrics 102(1):99-106

Tissue	Cases Exposure Route	Range	Mean	General Information
9681 Urine	a) 12 b) 16 Ingestion	a) Not given b) Not given	a) 2.5+/-0.1 g/d b) 1.8+/-0.1 g/d S.E.	a) Males b) Females Means, composites of 24-hr samples taken for 7 d, 4x/yr. Ratio of Na-K intake probably more important than intake of either. 1.9-5.6 g/d considered adequate range of intake. Healthy 20-53 yr olds, taking no vitamin or mineral supplements AAS

URINE; SODIUM; POTASSIUM; DIETS; ADULTS; MINERAL METABOLISM
Holbrook, J.R.; Patterson, K.Y.; Bodner, J.E.; Douglas, L.W.; Veillon, C.; Kelsay, J.L.; Mertz, W.; Smith, J.C., Jr. 1984 American Journal of Clinical Nutrition 40:786-793

Potassium
7440-09-7
K
AtW 39.098, MP 63.2 C, BP 765.5 C, VP 100 mm Hg at 500 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9682 Urine	9	a) Not given b) Not given	a) 2655+/-721 mg/d b) 2048+/-175 mg/d	a) Day of 6 mi run b) Non-run day No significant difference ($p<0.05$). Fasted from 10 hr before to 2 hr after run. Also measured phosphate. 23-46 yr old male runners AAS

BLOOD SERUM; URINE; CALCIUM; CHROMIUM; COPPER; POTASSIUM; SODIUM; ZINC; TRACE ELEMENTS; ADULTS
Anderson, R.A.; Polansky, M.M.; Bryden, N.A. 1984 Biological Trace Element Research 6:327-336

Tissue	Cases Exposure Route	Range	Mean	General Information
9683 Urine	15 Ingestion	a) 3.0-3 mEq/hr b) 1.0-1.1 mEq/hr Ranges of means	a) Not applicable b) Not applicable	a) Controls, 0-8 hr and 24-48 hr pool. 1.9 mEq/hr in 8-24 hr pool b) Patients, 0-8 hr and 48-72 hr pool. 1.25 mEq/hr in 24-48 hr pool Single 200 mg oral dose of triamtereme. Estimated from graph. 8 controls, 30+/-2 yrs old, 69+/-4 kg. 7 alcoholic cirrhosis patients, 55+/-8 yrs old, 54+/-5 kg HPLC

BLOOD PLASMA; URINE; DELIBERATE EXPOSURE; CIRRHOSIS; DIURETICS; POTASSIUM
Villeneuve, J.P.; Rocheleau, P.; Raymond, G. 1984 Clinical Pharmacology and Therapeutics 35(6):831-837

Propanoic acid, 2-(2,4,5-trichlorophenoxy)-
93-72-1
C9-H7-Cl3-O3
MW 269.53, MP 182 C (also reported as 181.6 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9684 Urine				Review. General information, reported levels, sources of exposure, metabolites, and methods of analysis for: phthalate ester plasticizers, chlorophenoxy acid herbicides, chlorophenol biocides, p-nitrophenol, simple phenols, benzenediols, and toluene.

URINE; ENVIRONMENTAL EXPOSURE; OCCUPATIONAL EXPOSURE; DELIBERATE EXPOSURE; CONSUMER EXPOSURE; ADULTS; REVIEW; CARCINOMAS; POISONING; MEASUREMENT METHODS; PESTICIDES; INDUSTRIAL CHEMICALS; HERBICIDES; INSECTICIDES; FUNGICIDES; PENTACHLOROPHENOL; SOLVENTS; BENZENES; PHENOLS; INDUSTRIAL POLLUTION; TOLUENE; BLOOD; CARCINOGEN; METABOLISM; METABOLITES; WOOD PRESERVATIVES
Fatiadi, A.J. 1983 Priority Toxic Pollutants in Human Urine: Their Occurrence and Analysis, Aug. 1983, 60 p

Propanoic acid, 2-(4-chloro-2-methylphenoxy)-, (+-)-
7085-19-0
C10-H11-Cl-O3
MW 214.66, MP 94-95 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9685 Bile	1 Ingestion	Not applicable	530 mg/L	Autopsy samples after unknown dose of Killex (a mixture of 100 g 2,4-D/L, 50 g mecoprop/L, 9 g dicamba/L). Death within approximately 5 hr. 61 yr old suicide victim with history of mental illness and chronic alcoholism Comatose, distress, low blood pressure, peculiar odor on breath, heavy breathing, distended aldomen, vomiting Elevated white cell count. At autopsy, large volume of blood in pleural cavity HPLC

DELIBERATE EXPOSURE; SUICIDE; AUTOPSIES; PESTICIDES; HERBICIDES; BLOOD; URINE; BILE; LIVER

Fraser, A.D.; Isner, A.P.; Perry, R.A. 1984 Journal of Forensic Sciences 29(4):1237-1241

Tissue	Cases Exposure Route	Range	Mean	General Information
9686 Bile	1 Ingestion	Not given	945.2 ug/g	Postmortem. Ingested 1200 mg/kg chlorophenoxy acetic acids (360 mL Dexol, 360 mL Weed-B-Gone M, few granules D-Con concentrate). Patient died at 30 hr. 26 yr old male, committed suicide, CA Coma, myoclonus, pinpoint pupils, cardiac arrhythmias, progressive hypotension, oliguria. Death after episodes of asystole. Congested, edematous lungs, denuded duodenal mucosa with recent hemorrhage, diffuse mild liver necrosis. HPLC; GC

BLOOD PLASMA; BILE; BRAIN; CEREBROSPINAL FLUID; BLOOD; LIVER; PANCREAS; HEART; DIAPHRAGM; KIDNEYS; DELIBERATE EXPOSURE; CALIFORNIA; SUICIDE; CASE HISTORIES; AUTOPSIES; HERBICIDES; PESTICIDES; INSECTICIDES; ORGANOPHOSPHATES

Osterloh, J.; Lotti, M.; Pond, S.M. 1983 Journal of Analytical Toxicology 7:125-129

Tissue	Cases Exposure Route	Range	Mean	General Information
9687 Blood	1 Ingestion	Not applicable	530 mg/L	Autopsy samples after unknown dose of Killex (a mixture of 100 g 2,4-D/L, 50 g mecoprop/L, 9 g dicamba/L). Death within approximately 5 hr. 61 yr old suicide victim with history of mental illness and chronic alcoholism Comatose, distress, low blood pressure, peculiar odor on breath, heavy breathing, distended aldomen, vomiting Elevated white cell count. At autopsy, large volume of blood in pleural cavity HPLC

DELIBERATE EXPOSURE; SUICIDE; AUTOPSIES; PESTICIDES; HERBICIDES; BLOOD; URINE; BILE; LIVER

Fraser, A.D.; Isner, A.P.; Perry, R.A. 1984 Journal of Forensic Sciences 29(4):1237-1241

Propanoic acid, 2-(4-chloro-2-methylphenoxy)-, (+-)-
7085-19-0
C10-H11-Cl-O3
MW 214.66, MP 94-95 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9686 Blood	1 Ingestion	Not given	325.5 ug/g	Postmortem. Ingested 1200 mg/kg chlorophenoxy acetic acids (360 mL Dexol, 360 mL Weed-B-Gone M, few granules D-Con concentrate). Patient died at 30 hr. 26 yr old male, committed suicide, CA Coma, myoclonus, pinpoint pupils, cardiac arrhythmias, progressive hypotension, oliguria. Death after episodes of asystole. Congested, edematous lungs, denuded duodenal mucosa with recent hemorrhage, diffuse mild liver necrosis. HPLC; GC
9689 Blood, plasma	1 Ingestion	388.6-270.0 ug/g	Not applicable	1.6-30 hr, peak 480.8 ug/g at 21 hr. Ingested 1200 mg/kg chlorophenoxy acetic acids (30 mL Dexol, 360 mL Weed-B-Gone M, few granules D-Con concentrate). Patient died at 30 hr. 26 yr old male, committed suicide, CA Coma, myoclonus, pinpoint pupils, cardiac arrhythmias, progressive hypotension, oliguria. Death after episodes of asystole. Congested, edematous lungs, denuded duodenal mucosa with recent hemorrhage, diffuse mild liver necrosis. HPLC; GC
9690 Brain	1 Ingestion	a) Not given b) Not given c) Not given	a) 75.3 ug/g b) 178.2 ug/g c) 164.2 ug/g	a) Gray matter (frontal lobe) b) White matter (frontal lobe) c) Brain stem 26 yr old male, committed suicide, CA Coma, myoclonus, pinpoint pupils, cardiac arrhythmias, progressive hypotension, oliguria. Death after episodes of asystole. Congested, edematous lungs, denuded duodenal mucosa with recent hemorrhage, diffuse mild liver necrosis. HPLC; GC
9691 Cerebrospinal fluid	1 Ingestion	Not given	58.2 ug/g	Postmortem. Ingested 1200 mg/kg chlorophenoxy acetic acids (30 mL Dexol, 360 mL Weed-B-Gone M, few granules D-Con concentrate). Patient died at 30 hr. 26 yr old male, committed suicide, CA Coma, myoclonus, pinpoint pupils, cardiac arrhythmias, progressive hypotension, oliguria. Death after episodes of asystole. Congested, edematous lungs, denuded duodenal mucosa with recent hemorrhage, diffuse mild liver necrosis. HPLC; GC

(next page)

Propanoic acid, 2-(4-chloro-2-methylphenoxy)-, (+-)-
7085-19-0
C10-H11-Cl-O3
MW 214.66, MP 94-95 C

(continued)

Tissue	Cases Exposure Route	Range	Mean	General Information
9692 Diaphragm	1 Ingestion	Not given	233.7 ug/g	Postmortem. Ingested 1200 mg/kg chlorophenoxy acetic acids (360 mL Dexol, 360 mL Weed-B-Gone M, few granules D-Con concentrate). Patient died at 30 hr. 26 yr old male, committed suicide, CA Coma, myoclonus, pinpoint pupils, cardiac arrhythmias, progressive hypotension, oliguria. Death after episodes of asystole. Congested, edematous lungs, denuded duodenal mucosa with recent hemorrhage, diffuse mild liver necrosis. HPLC; GC
9693 Heart	1 Ingestion	Not given	217.5 ug/g	Left ventricle. Postmortem. Ingested 1200 mg/kg chlorophenoxy acetic acids (360 mL Dexol, 360 mL Weed-B-Gone M, few granules D-Con concentrate). Patient died at 30 hr. 26 yr old male, committed suicide, CA Coma, myoclonus, pinpoint pupils, cardiac arrhythmias, progressive hypotension, oliguria. Death after episodes of asystole. Congested, edematous lungs, denuded duodenal mucosa with recent hemorrhage, diffuse mild liver necrosis. HPLC; GC
9694 Kidney	1 Ingestion	Not given	277.0 ug/g	Postmortem. Ingested 1200 mg/kg chlorophenoxy acetic acids (360 mL Dexol, 360 mL Weed-B-Gone M, few granules D-Con concentrate). Patient died at 30 hr. 26 yr old male, committed suicide, CA Coma, myoclonus, pinpoint pupils, cardiac arrhythmias, progressive hypotension, oliguria. Death after episodes of asystole. Congested, edematous lungs, denuded duodenal mucosa with recent hemorrhage, diffuse mild liver necrosis. HPLC; GC
BLOOD PLASMA; BILE; BRAIN; CEREBROSPINAL FLUID; BLOOD; LIVER; PANCREAS; HEART; DIAPHRAGM; KIDNEYS; DELIBERATE EXPOSURE; CALIFORNIA; SUICIDE; CASE HISTORIES; AUTOPSIES; HERBICIDES; PESTICIDES; INSECTICIDES; ORGANOPHOSPHATES				
Osterloh, J.; Lotti, M.; Pond, S.M. 1983 Journal of Analytical Toxicology 7:125-129				

Tissue	Cases Exposure Route	Range	Mean	General Information
9695 Liver	1 Ingestion	Not applicable	500 mg/kg	Autopsy samples after unknown dose of Killex (a mixture of 100 g 2,4-D/L, 50 g mecoprop/L, 9 g dicamba/L). Death within approximately 5 hr. 61 yr old suicide victim with history of mental illness and chronic alcoholism Comatose, distress, low blood pressure, peculiar odor on breath, heavy breathing, distended aldomen, vomiting Elevated white cell count. At autopsy, large volume of blood in pleural cavity HPLC
DELIBERATE EXPOSURE; SUICIDE; AUTOPSIES; PESTICIDES; HERBICIDES; BLOOD; URINE; BILE; LIVER				
Fraser, A.D.; Isner, A.F.; Perry, R.A. 1984 Journal of Forensic Sciences 29(4):1237-1241				

Propanoic acid, 2-(4-chloro-2-methylphenoxy)-, (+-)-
7085-19-0
C10-H11-Cl-O3
MW 214.66, MP 94-95 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9696 Liver	1 Ingestion	Not given	237.4 ug/g	Postmortem. Ingested 1200 mg/kg chlorophenoxy acetic acids (360 mL Dexol, 360 mL Weed-B-Gone M, few granules D-Con concentrate). Patient died at 30 hr. 26 yr old male, committed suicide, CA Coma, myoclonus, pinpoint pupils, cardiac arrhythmias, progressive hypotension, oliguria. Death after episodes of asystole. Congested, edematous lungs, denuded duodenal mucosa with recent hemorrhage, diffuse mild liver necrosis. HPLC; GC
9697 Pancreas	1 Ingestion	Not given	160.8 ug/g	Postmortem. Ingested 1200 mg/kg chlorophenoxy acetic acids (360 mL Dexol, 360 mL Weed-B-Gone M, few granules D-Con concentrate). Patient died at 30 hr. 26 yr old male, committed suicide, CA Coma, myoclonus, pinpoint pupils, cardiac arrhythmias, progressive hypotension, oliguria. Death after episodes of asystole. Congested, edematous lungs, denuded duodenal mucosa with recent hemorrhage, diffuse mild liver necrosis. HPLC; GC
BLOOD PLASMA; BILE; BRAIN; CEREBROSPINAL FLUID; BLOOD; LIVER; PANCREAS; HEART; DIAPHRAGM; KIDNEYS; DELIBERATE EXPOSURE; CALIFORNIA; SUICIDE; CASE HISTORIES; AUTOPSIES; HERBICIDES; PESTICIDES; INSECTICIDES; ORGANOPHOSPHATES Osterloh, J.; Lotti, M.; Pond, S.M. 1983 Journal of Analytical Toxicology 7:125-129				

Tissue	Cases Exposure Route	Range	Mean	General Information
9698 Urine	1 Ingestion	Not applicable	520 mg/L	Autopsy samples after unknown dose of Killex (a mixture of 100 g 2,4-D/L, 50 g mecoprop/L, 9 g dicamba/L). Death within approximately 5 hr. 61 yr old suicide victim with history of mental illness and chronic alcoholism Comatose, distress, low blood pressure, peculiar odor on breath, heavy breathing, distended aldomen, vomiting Elevated white cell count. At autopsy, large volume of blood in pleural cavity HPLC
DELIBERATE EXPOSURE; SUICIDE; AUTOPSIES; PESTICIDES; HERBICIDES; BLOOD; URINE; BILE; LIVER Fraser, A.D.; Isner, A.F.; Perry, R.A. 1984 Journal of Forensic Sciences 29(4):1237-1241				

Propanoic acid, 2-(4-chloro-2-methylphenoxy)-, (+-)-
7085-19-0
C10-H11-Cl-O3
MW 214.66, MP 94-95 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9699 Urine	1 Ingestion	Not given	230.3 ug/g	1.6 hr. Ingested 1200 mg/kg chlorophenoxy acetic acids (30 mL Dexol, 360 mL Weed-B-Gone M, few granules D-Con concentrate). Patient died at 30 hr. 26 yr old male, committed suicide, CA Coma, myoclonus, pinpoint pupils, cardiac arrhythmias, progressive hypotension, oliguria. Death after episodes of asystole. Congested, edematous lungs, denuded duodenal mucosa with recent hemorrhage, diffuse mild liver necrosis. HPLC; GC
BLOOD PLASMA; BILE; BRAIN; CEREBROSPINAL FLUID; BLOOD; LIVER; PANCREAS; HEART; DIAPHRAGM; KIDNEYS; DELIBERATE EXPOSURE; CALIFORNIA; SUICIDE; CASE HISTORIES; AUTOPSIES; HERBICIDES; PESTICIDES; INSECTICIDES; ORGANOPHOSPHATES Osterloh, J.; Lotti, M.; Pond, S.M. 1985 Journal of Analytical Toxicology 7:128-129				

Propene, 1,3-dichloro-, (Z)- (8 CI); 1-Propene, 1,3-dichloro-, (Z)- (9 CI)
10061-01-5
C3-H4-Cl2
MW 110.97, BP 104.3 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9700 Urine	6	a) 0.96-8.95 mg/24 hr b) 0-5 mg/8 hr	a) Not given b) Not given	a) N-acetyl cysteine conjugate (3C-NAC) after 150-370 min exposures to 0.59-1.66 mg/cu m (air concentration). Five cases (four subjects) b) Recovery of 3C-NAC over 3 d. Exposure to 0.59 mg/cu m from 2-6 hr, and to 1.64 mg/cu m from 27.5-32 hr. Recovery 0.56 mg/8 hr just before second exposure. 1 case Telone formulation. No special protective clothing or devices used. Spot urines for 4 other subjects were 5.2-27 ug/mL. Improved assay. Some estimated from figure. Commercial applicators of soil fumigants, and observing investigators GC/MS
URINE; OCCUPATIONAL EXPOSURE; MEASUREMENT METHODS; CHLORINATED HYDROCARBONS; PESTICIDES; AGRICULTURE; HEALTH HAZARDS; METABOLITES Osterloh, J.D.; Cohen, B.-S.; Popendorf, W.; Pond, S.M. 1984 Archives of Environmental Health 39(4):271-275				

Propionaldehyde, 2-methyl-2-(methylthio)-, O-(methylcarbamoyl)oxime (8 CI); Propanal, 2-methyl-2-(methylthio)-, O-((methylamino)carbonyl)oxime (9 CI)
116-06-3
C7-H14-N2-O2-S
MW 190.25, MP 99-100 C, VP less than 0.5 mm Hg at 20 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9701 Blood	1 Dermal	a) Not given b) Not given	a) 0.106 ppm b) 0.374 ppm	a) Aldicarb sulfoxide metabolite b) Aldicarb sulfone metabolite Approximately 10 d after death. 20 yr old Mexican exposed and later crushed to death by a tractor. Apparently incapable of getting out of the way. Weakness in extremities, speech slurring, diaphoresis, pupillary mydriasis HPLC
9702 Kidney	1 Dermal	a) Not given b) Not given c) Not given	a) Trace b) 0.261 ppm c) 0.422 ppm	a) Aldicarb b) Aldicarb sulfoxide metabolite c) Aldicarb sulfone metabolite Approximately 10 d after death. 20 yr old Mexican exposed and later crushed to death by a tractor. Apparently incapable of getting out of the way. Weakness in extremities, speech slurring, diaphoresis, pupillary mydriasis HPLC
9703 Liver	1 Dermal	a) Not given b) Not given c) Not given	a) 0.013 ppm b) 0.058 ppm c) 0.116 ppm	a) Aldicarb after indeterminate exposure b) Aldicarb sulfoxide metabolite c) Aldicarb sulfone metabolite Approximately 10 d after death. 20 yr old Mexican exposed and later crushed to death by a tractor. Apparently incapable of getting out of the way. Weakness in extremities, speech slurring, diaphoresis, pupillary mydriasis HPLC
9704 Skin	1 Dermal	a) Not given b) Not given c) Not given d) Not given e) Not given f) Not given g) Not given h) Not given i) Not given	a) 0.492 ppm b) 0.157 ppm c) 0.174 ppm d) 0.005 ppm e) 0.015 ppm f) Trace g) 0.168 ppm h) 0.126 ppm i) 0.083 ppm	a) Aldicarb on hand b) Aldicarb sulfoxide metabolite on hand c) Aldicarb sulfone metabolite on hand d) Aldicarb on abdomen e) Aldicarb sulfoxide on abdomen f) Aldicarb sulfone metabolite on abdomen g) Aldicarb on thigh h) Aldicarb sulfoxide metabolite on thigh i) Aldicarb sulfone metabolite on thigh Approximately 10 d after death. 20 yr old Mexican exposed and later crushed to death by a tractor. Apparently incapable of getting out of the way. Weakness in extremities, speech slurring, diaphoresis, pupillary mydriasis HPLC

BLOOD; LIVER; SKIN; OCCUPATIONAL EXPOSURE; CALIFORNIA; ADULTS; NEUROLOGIC MANIFESTATIONS; AUTOPSIES; CASE HISTORIES; FORENSIC MEDICINE; PESTICIDES; ACCIDENTAL POISONING; AGRICULTURE; BIOACCUMULATION; FARMS; HEALTH HAZARDS; INDUSTRIAL ACCIDENTS; OCCUPATIONAL HAZARDS; PESTICIDE RESIDUES; SOILS

Lee, M.H.; Ransdell, J.F. 1984 Journal of Toxicology and Environmental Health 14:239-246

Propionic acid, 2-(2,4-dichlorophenoxy)- (8 CI); Propanoic acid, 2-(2,4-dichlorophenoxy)- (9 CI)
120-36-5
C9-H8-Cl2-O3
MW 235.10, MP 117.5-118.1 C, VP negligible at room temp

Tissue	Cases Exposure Route	Range	Mean	General Information
9705 Urine	a) 6 b) 5 Dermal Inhalation	a) 0.11-3.36 mg/kg b) 0.47-16.30 mg/kg	a) 1.27 mg/kg b) 5.67 mg/kg	a) Spray gun, roadside, 2 locations, 1980 b) Spray gun, rights-of-way, 1980 Adult herbicide applicators performing spray operations in Ontario. Workers used improved safety precautions in 1980. GC
URINE; SKIN; LUNGS; OCCUPATIONAL EXPOSURE; CANADA; ADULTS; INDUSTRIAL HYGIENE; HERBICIDES; HEALTH HAZARDS; INHALATION; OCCUPATIONAL HAZARDS Libich, S.; To, J.C.; Frank, R.; Sirons, G.J. 1984 American Industrial Hygiene Association Journal 45(1):56-62				

Pyrrolidine, 1-nitroso-
930-55-2
C4-H8-N2-O
MW 100.2, BP 214 C at 760 mm Hg

Tissue	Cases Exposure Route	Range	Mean	General Information
9706 Saliva	1 Ingestion	Not applicable	67 ng/ml	Tobacco chewers. Compounds from tobacco or formed in situ by nitrosation of alkaloids. No N-nitroso compounds in non-chewers. Not detected in 6 other cases 25-40 yr old habitual tobacco chewers and controls (non-chewers) Oral cavities of chewers may be constantly exposed to nitroso compounds. Chewing has been associated with oral cancer GLC-TEA; HPLC
SALIVA; DELIBERATE EXPOSURE; INDIA; NITROSAMINES; TOBACCOS Sipahimalani, A.T.; Chadha, M.S.; Bhidi, S.V.; Pratap, A.I.; Nair, J. 1984 Food and Chemical Toxicology 22(4):261-264				

Rubidium
7440-17-7
Rb
AtW 85.4678, MP 39 C, BP 688 C, VP 10 mm Hg at 390 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9707 Blood, plasma		a) Not given b) Not given c) Not given	a) 0.102+/-0.015 ug/mL b) 0.166+/-0.053 ug/mL c) 0.111+/-0.014 ug/mL	a) Insulin-treated diabetics b) Non-insulin-treated diabetics c) Control non-diabetics Collected after overnight fasting. Significant differences among all groups. 18-78 yr olds, Oxford, England NA; AAS
BLOOD PLASMA; ENGLAND; DIABETES; METABOLISM; MINERAL METABOLISM; ALUMINUM; ANTIMONY; ARSENIC; BARIUM; BROMINE; CADMIUM; CALCIUM; CESIUM; CHROMIUM; COBALT; COPPER; IODINE; IRON; LEAD; MAGNESIUM; MANGANESE; MERCURY; MOLYBDENUM; NICKEL; RUBIDIUM; SCANDIUM; SELENIUM; SILVER; TIN; VANADIUM; ZINC Ward, N.I.; Pim, B. 1984 Biological Trace Element Research 6:469-487				

Rubidium
7440-17-7
Rb
AtW 85.4678, MP 39 C, BP 688 C, VP 10 mm Hg at 390 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9708 Brain		a) 0.5X10(E-5)-1.5X10(E-5) b) 1.0X10(E-5)-2.0X10(E-5) c) 0.5X10(E-5)-1.55X10(E-5) d) 1.0X10(E-5)-2.6X10(E-5) e) Not applicable f) Not given g/g dr wt	a) Not given b) Not given c) Not given d) Not given e) 2.75X10(E-5) f) 2.25+/-0.25X10(E-5) g/g dr wt	a) Samples from 8 cerebral cortical regions, 3 alcohol abuse patients b) Normals c) Samples from 11 cerebral nuclei, alcohol abuse patients d) Normals e) Samples from caudate nucleus, endogeneous psychosis patient f) Normals Estimated from figure, a)-d) ranges of means. Samples dissected 20-24 hr after death. 50-79 yr olds NA
BRAIN; AUTOPSIES; CASE HISTORIES; BEHAVIOR DISORDERS; COBALT; IRON; RUBIDIUM; ALCOHOLIC BEVERAGES; SELENIUM; ZINC Demmel, U.; Hock, A.; Feinendegen, L.E.; Sebek, P. 1984 Science of the Total Environment 38:69-77				

Tissue	Cases Exposure Route	Range	Mean	General Information
9709 Breast	22	a) Not given b) Not given	a) 9.2+/-3.2 ug/g b) 19.7+/-6.1 ug/g	a) Normal tissue b) Neoplastic Dry wt, 3 samples, p=0.0001 Patients with primary breast carcinoma, samples of normal and neoplastic tissue obtained at time of mastectomy X-ray fluorescence
BREAST; CALCIUM; VANADIUM; CHROMIUM; MANGANESE; IRON; NICKEL; COPPER; ZINC; ARSENIC; SELENIUM; BROMINE; RUBIDIUM; STRONTIUM; MOLYBDENUM; LEAD; MERCURY; NEOPLASMS Rizk, S.L.; Sky-Peck, H.H. 1984 Cancer Research 44:5390-5394				

Samarium
7440-19-9
Sm
AtW 150.4, MP 1072 C, BP 1778 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9710 Lung	a) 1 b) 10 Inhalation	a) Not given b) Not given	a) 4,550 ppb b) 2.5 ppb	a) Exposed worker, biopsy b) Unexposed controls, autopsies 58 yr old photoengraver, exposed to smoke from carbon arc lamp during 46 yr. 20-83 yr old controls. Italy Worker: dyspnea, cough, cyanosis (extremities), crepitant rales, pulmonary fibrosis, hypertension, cardiac hypertrophy and overloading, death from acute cardiorespiratory insufficiency NA
9711 Lymph node	a) 1 b) 2 Inhalation	a) Not given b) Not given	a) 321 ppb b) 3.7 ppb	a) Exposed worker, biopsy b) Unexposed controls, autopsies 58 yr old photoengraver, exposed to smoke from carbon arc lamp during 46 yr. 20-83 yr old controls. Italy Worker: dyspnea, cough, cyanosis (extremities), crepitant rales, pulmonary fibrosis, hypertension, cardiac hypertrophy and overloading, death from acute cardiorespiratory insufficiency NA

NEODYMIUM; YTTERBIUM; TERBIUM; EUROPIUM; LUTETIUM; ITALY; ADULTS; AUTOPSIES; CASE HISTORIES; PNEUMOCONIOSIS; LUNGS; LYMPH NODES; BIOPSIES; CERIUM; LANTHANUM; METALS; SAMARIUM; THORIUM; DUST; FUMES; INHALATION; OCCUPATIONAL HAZARDS; PRINTING INDUSTRY; OCCUPATIONAL EXPOSURE
Vocaturo, G.; Colombo, F.; Zanoni, M.; Rodi, F.; Sabbioni, E.; Pietra, R. 1983 Chest 83(5):780-783

Scandium
7440-20-2
Sc
AtW 44.9559, MP 1538 C, BP 2832 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9712 Blood, plasma		a) Not given b) Not given c) Not given	a) 0.0020+/-0.0005 ug/mL b) 0.0024+/-0.0006 ug/mL c) 0.0024+/-0.0005 ug/mL	a) Insulin-treated diabetics b) Non-insulin-treated diabetics c) Control non-diabetics Collected after overnight fasting. Significant differences between a), c) and a), b). 16-78 yr olds, Oxford, England NA; AAS

BLOOD PLASMA; ENGLAND; DIABETES; METABOLISM; MINERAL METABOLISM; ALUMINUM; ANTIMONY; ARSENIC; BARIUM; BROMINE; CADMIUM; CALCIUM; CESIUM; CHROMIUM; COBALT; COPPER; IODINE; IRON; LEAD; MAGNESIUM; MANGANESE; MERCURY; MOLYBDENUM; NICKEL; RUBIDIUM; SCANDIUM; SELENIUM; SILVER; TIN; VANADIUM; ZINC
Ward, N.I.; Pim, B. 1984 Biological Trace Element Research 6:469-487

Selenium
7782-49-2
Se
AtW 78.96, MP 170-217 C, BP 685 C, VP 1 mm Hg at 356 C, 10 mm Hg at 420 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9713 Blood	a) 75 b) 353 c) 31 d) 41 e) 90 f) 238 g) 70 h) 56 i) 353 j) 72 k) 24	a) Not given b) Not given c) Not given d) Not given e) Not given f) Not given g) Not given h) Not given i) Not given j) Not given k) Not given	a) 12.3+/-0.2 ug b) 8.8+/-0.1 ug c) 12.6+/-0.3 ug d) 9.4+/-0.3 ug e) 8.2+/-0.2 ug f) 8.8+/-0.2 ug g) 8.1+/-0.1 h) 8.8+/-0.2 ug i) 8.8+/-0.1 ug j) 6.2+/-0.2 ug k) 7.3+/-0.4 ug /100 ml, S.E.	a) Beijing adults. Age adjusted male cancer death rate 12/100,000 b) Yun-Xi adults. Age adjusted male cancer death rate 108/100,000 c) Beijiyouths d) Yun-Xi youths e) Yunnan tin miners working underground. Age adjusted mortality rate, lung cancer, males 250/100,000 f) Yunnan tin miners working above ground. Age adjusted mortality rate, lung cancer, males 42/100,000 g) Workers with frequent As exposures h) Workers with infrequent As exposures i) Normal, controls for j), k) j) Yun-Xi patients with lung cancer k) Yun-Xi patients with non-cancerous lung diseases <0.001 for a)-b), i)-j). $p<0.01$ for e)-f) and g)-h), i)-k). Inverse correlation between blood Se and lung cancer death rates. Se levels not only factor as evidenced in cases of underground vs above ground miners. Workers at Yunnan Tin Mine (Yun-Xi) and Beijing residents, China Fluorimetry
BLOOD; SELENIUM; CHINA; OCCUPATIONAL EXPOSURE; AGE; NEOPLASMS; MINING Chu, Y-J.; Liu, Q-Y.; Hou, C.; Yu, S-Y. 1984 Biological Trace Element Research 6:133-137				

Tissue	Cases Exposure Route	Range	Mean	General Information
9714 Blood	9	0.109-0.202 ppm	0.16 ppm	Fasting. Blood drawn 3-4 days apart, levels < in toenails or hair. Adults, Boston, MA NA
BLOOD; HAIR; NAILS; GEORGIA; MASSACHUSETTS; NEW ZEALAND; SOUTH DAKOTA; DIETS; SELENIUM; BIOINDICATORS; COMPARATIVE EVALUATIONS Morris, J.S.; Stampfer, M.J.; Willett, W. 1984 Biological Trace Element Research 5:529-537				

Selenium
7782-49-2
Se
AtW 78.96, MP 170-217 C, BP 685 C, VP 1 mm Hg at 356 C, 10 mm Hg at 420 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9715 Blood	154 Ingestion	a) Not given b) Not given c) Not given d) Not given e) Not given f) Not given g) Not given h) Not given	a) 173.3 ug/l b) 185.5 ug/l c) 141.9 ug/l d) 126.7 ug/l e) 86.3 ug/l f) 118.4 ug/l g) 66.1 ug/l h) 73.8 ug/l	a) 27 males, more than 6 seal meals/wk b) 35 females c) 12 males, 1-6 seal meals/wk d) 8 females e) 12 males, 1 seal meal or less/wk f) 24 females g) 9 males, Danes, eat predominately imported food h) 9 females, Danes Correlation between blood-Se and age, younger people eat more imported foods from low Se areas. Residents of Angmagssalik, East Greenland. Danes temporarily in Greenland. AAS
BLOOD; HAIR; ENVIRONMENTAL EXPOSURE; DENMARK; GREENLAND; AGE; MERCURY; SELENIUM; DIETS; BIOACCUMULATION Hansen, J.C.; Kromann, N.; Wulf, H.C.; Alboge, K. 1984 Science of the Total Environment 38:33-40				

Tissue	Cases Exposure Route	Range	Mean	General Information
9716 Blood		a) Not given b) Not given c) Not given d) Not given e) Not given f) Not given g) Not given h) Not given i) Not given j) Not given	a) 180 ng/ml b) 234 ng/ml c) 157 ng/ml d) 162 ng/ml e) >200 ng/ml f) 21 ng/ml g) 58 ng/ml h) 50 ng/ml i) 68 ng/ml j) 77 ng/ml	a) Canada (Hamilton), parts of US b) Wyoming c) Cleveland, OH d) California e) Venezuela f) China (Keshan) g) Finland h) New Zealand i) Egypt j) Italy (Amiata) Other areas in China, 95 ng/ml. Other countries, 90-130 ng/ml. Levels from database containing data on "normal" levels of 15 elements in 7 tissues/fluids. Data selected by 60 investigators in over 40 countries. Diet, environment both important in distribution of elements.
ZINC; COPPER; MANGANESE; SELENIUM; LEAD; CADMIUM; BLOOD; BLOOD SERUM; HAIR; MILK; BANGLADESH; INDIA; TURKEY; FINLAND; ITALY; NEW ZEALAND; GUATEMALA; CHILE; SWEDEN; HUNGARY; YUGOSLAVIA; POLAND; KENYA; EGYPT; SOUTH AFRICA; UNITED STATES; AUSTRALIA; GREECE; PAKISTAN; NIGERIA; PHILIPPINES; ZAIRE; THAILAND; CHINA; WYOMING; OHIO; CALIFORNIA; JAPAN; MEXICO; CANADA; ISRAEL; PERU; SPAIN; COMPARATIVE EVALUATIONS; BIOLOGICAL MONITORING; IRAN; DIETS; ENVIRONMENTAL EXPOSURE Iyengar, G.V. 1984 Science of the Total Environment 38:125-131				

Selenium
7782-49-2
Se
AtW 78.96, MP 170-217 C, BP 685 C, VP 1 mm Hg at 356 C, 10 mm Hg at 429 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9717 Blood	Ingestion	a) Not given b) Not given	a) 0.148+/-0.003 ug/ml b) 0.173+/-0.003 ug/ml S.E.	a) Rural, p=0.0000 b) Urban 21-45 yr age group had highest levels. 73 rural, old order amish, 82 urban residents, Columbus, Ohio 4-76 yr olds Fluorometry

BLOOD; BLOOD PLASMA; ERYTHROCYTES; ENVIRONMENTAL EXPOSURE; OHIO; AGE; COMPARATIVE EVALUATIONS; SELENIUM; VITAMIN E; BIOLOGICAL MONITORING; DIETS; RURAL AREAS; URBAN AREAS; BIOAVAILABILITY
Snook, J.T.; Palmquist, D.L.; Mexon, A.L.; Cantor, A.H.; Vivian, V.M. 1985 American Journal of Clinical Nutrition 38:620-630

Tissue	Cases Exposure Route	Range	Mean	General Information
9718 Blood, cells	a) 40 b) 45 c) 66 d) 55 e) 206	a) Not given b) Not given c) Not given d) Not given e) Not given	a) 0.147+/-0.025 ug/ml b) 0.159+/-0.039 ug/ml c) 0.167+/-0.039 ug/ml d) 0.152+/-0.029 ug/ml e) 0.158+/-0.035 ug/ml	a) Black males b) Black females c) White males d) White females e) Total of above Differing: P<0.05 - Black/white females, Black males/females, White females/males, P<0.01 - Black/white males. Some differences more pronounced in 20-45 yr olds. Inverse correlations with yr of smoking and coffee intake. U.S. mean for whole blood=0.206 ug/ml, this study=0.128 ug/ml Healthy students from Paine College, A.R. Johnson Health Professional High School, students and employees of Medical College of GA, Augusta. Coastal region a "stroke belt" Data do not relate to cardiovascular or esophageal cancer risks, both problems in the area Fluorimetry

SELENIUM; BLOOD PLASMA; BLOOD; GEORGIA; RACIAL STUDIES; SEX
McAdam, P.A.; Smith, D.K.; Feldman, E.B.; Hames, C. 1984 Biological Trace Element Research 6:3-9

Tissue	Cases Exposure Route	Range	Mean	General Information
9719 Blood, cells	a) 16 b) 32 Ingestion	a) 0.75-2.25 pmol b) 1.4-3.3 pmol /10(E+6) cells	a) Not given b) Not given	a) Patients on gluten-free diets b) Controls Estimated from graphs 16 coeliac disease patients, ages 23-71 (mean 50.6) yr and 32 healthy controls, ages 21-74 (mean 49.5) yr Hydride generation; AAS

BLOOD; BLOOD PLASMA; LEUKOCYTES; UNITED KINGDOM; GASTROINTESTINAL DISEASES; NUTRITIONAL DISORDERS; COMPARATIVE EVALUATIONS; SELENIUM; DIETS
Hinks, L.J.; Inwards, K.D.; Lloyd, B.; Clayton, B.E. 1984 British Medical Journal 288:1862-1863

Selenium
7782-49-2
Se
AtW 78.96, MP 170-217 C, BP 685 C, VP 1 mm Hg at 356 C, 10 mm Hg at 429 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9720 Blood, cells	4 Ingestion	a) Not given b) Not given c) Not given d) Not given	a) 0.436+/-0.019 ug b) 0.486+/-0.060 ug c) 0.480+/-0.017 ug d) 0.455+/-0.025 ug /g freeze dried	a) 1-10 d on diet with 137.7+/-0.1 ug Se/d b) d 13 on diet with 11.4+/-0.1 ug Se/d (d 11-45) c) d 34 d) d 45 Controlled, nutritionally complete diet. In addition, received 106.8 ug Se-74 on d 4 and d 30, fasting before and after. Healthy Massachusetts Institute of Technology students, 19-30 yr old, 63-74 kg, Cambridge, Massachusetts
BLOOD PLASMA; ERYTHROCYTES; URINE; DELIBERATE EXPOSURE; MASSACHUSETTS; ADULTS; SELENIUM; DIETS; TRACE ELEMENTS				
Janghorbani, M.; Kasper, L.J.; Young, V.R. 1984 American Journal of Clinical Nutrition 40: 208-218				

Tissue	Cases Exposure Route	Range	Mean	General Information
9721 Blood, cells	a) 9 b) 12	a) 0.55+/-0.05-0.63+/-0.05 mg Se/mg Hb b) Not given Range of means S.E.	a) Not applicable b) 0.679+/-0.05 mg Se/mg Hb S.E.	a) Alcoholics, days 2 and 7 of hospitalization b) Controls Erythrocyte levels. Acutely inebriated subjects, detox unit, Baltimore, MD. Mean age 47+/-3 yr. Mean duration ethanol consumption 11+/-3 mo Fluorometry
BLOOD PLASMA; URINE; NUTRITIONAL DEFICIENCIES; ALCOHOLISM; ALCOHOLIC BEVERAGES; SELENIUM; MARYLAND; BLOOD CELLS				
Dutta, S.K.; Miller, P.A.; Greenberg, L.B.; Levander, O.A. 1983 American Journal of Clinical Nutrition 38:713-718				

Tissue	Cases Exposure Route	Range	Mean	General Information
9722 Blood, plasma	a) 40 b) 45 c) 66 d) 55 e) 206	a) Not given b) Not given c) Not given d) Not given e) Not given	a) 0.098+/-0.020 ug/ml b) 0.103+/-0.025 ug/ml c) 0.111+/-0.020 ug/ml d) 0.102+/-0.018 ug/ml e) 0.104+/-0.021 ug/ml	a) Black males b) Black females c) White males d) White females e) Totals of above Differing: $P<0.05$ - Black/white females, Black males/females, $P<0.01$ - White females/males, $P<0.001$ - Black/white males. Some differences more pronounced in 20-45 yr olds. U.S. mean for whole blood is 0.206 ug/ml, this study is 0.128 ug/ml. Healthy students from Paine College, A.R. Johnson Health Professional High School, students and employees of Medical College of GA, Augusta. Coastal region a "stroke belt" Data do not relate to cardiovascular or esophageal cancer risks, both problems in the area Fluorimetry
SELENIUM; BLOOD PLASMA; BLOOD; GEORGIA; RACIAL STUDIES; SEX				
McAdam, P.A.; Smith, D.K.; Feldman, E.B.; Hamce, C. 1984 Biological Trace Element Research 6:3-9				

Selenium
7782-49-2
Se
AtW 78.96, MP 170-217 C, BP 685 C, VP 1 mm Hg at 356 C, 10 mm Hg at 420 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9723 Blood, plasma	a) 15 b) 24 c) 19 d) 33	a) 90-179 ug/L b) 64-171 ug/L c) 37-162 ug/L d) 45-137 ug/L	a) 136.3+/-6.07 ug/L b) 119.2+/-6.02 ug/L c) 111.3+/-10.23 ug/L d) 105.2+/-4.26 ug/L	a) Narrowing of up to 50% of any coronary artery lumen b) Narrowing of 50% or more in 1 major coronary artery lumen c) Narrowing of 50% or more in 2 of major coronary artery lumens d) Narrowing of 50% or more in 3 of major coronary artery lumens Significant inverse correlation between levels and severity of atherosclerosis. c) and d) different from a), $p<0.05$ and, 0.01, respectively Patients being evaluated by coronary arteriography for clinical evaluation of chest pain Fluorimetry
SELENIUM; BLOOD PLASMA; CARDIOVASCULAR DISEASES Moore, J.A.; Nolva, R.; Wells, I.C. 1984 Clinical Chemistry 30(7):1171-1173				

Tissue	Cases Exposure Route	Range	Mean	General Information
9724 Blood, plasma	27 Ingestion	a) Not given b) Not given c) Not given d) Not given e) Not given	a) 141+/-6 ng/ml b) 127 +/-7 ng/ml c) 138+/-5 ng/ml d) 132+/-5 ng/ml e) 134+/-3 ng/ml S.E.	a) Spring b) Summer c) Fall d) Winter e) Annual mean Sampled during 4 1-wk metabolic periods over 1 yr. 12 males, 15 females selected for regular eating habits, non-vegetarian diets, no dietary supplements. No significant sex difference. 1 ug/kg body wt needed daily to maintain balance. Excessive supplementation should be avoided. Beltsville, MD area, 19-50 yr MS; Fluorometry
BLOOD PLASMA; URINE; MARYLAND; ADULTS; SELENIUM; DIETS; METABOLISM Levander, O.A.; Morris, V.C. 1984 American Journal of Clinical Nutrition 39:809-815				

Tissue	Cases Exposure Route	Range	Mean	General Information
9725 Blood, plasma	a) 16 b) 32 Ingestion	a) 0.7-1.6 umol/l b) 1.3-1.8 umol/l	a) Not given b) Not given	a) Patients on gluten-free diets b) Controls Estimated from graphs 16 coeliac disease patients, ages 23-71 (mean 50.6) yr and 32 healthy controls, ages 21-74 (mean 49.5) yr Hydride generation; AAS
BLOOD; BLOOD PLASMA; LEUKOCYTES; UNITED KINGDOM; GASTROINTESTINAL DISEASES; NUTRITIONAL DISORDERS; COMPARATIVE EVALUATIONS; SELENIUM; DIETS Hinks, L.J.; Inwards, K.D.; Lloyd, B.; Clayton, B.E. 1984 British Medical Journal 288:1862-1865				

Selenium
7782-49-2
Se
AtW 78.96, MP 170-217 C, BP 685 C, VP 1 mm Hg at 356 C, 10 mm Hg at 429 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9726 Blood, plasma	4 Ingestion	a) Not given b) Not given c) Not given d) Not given	a) 0.115+/-0.009 ug/ml b) 0.106+/-0.007 ug/ml c) 0.083+/-0.009 ug/ml d) 0.090+/-0.005 ug/ml	a) 1-10 d on diet with 107.7+/-0.1 ug Se/d b) d 13 on diet with 11.4+/-0.1 ug Se/d (d 11-45) c) d 34 d) d 45 Controlled, nutritionally complete diet. In addition, received 108.8 ug Se-74 on d 4 and d 39, fasting before and after. Healthy Massachusetts Institute of Technology students, 19-20 yr old, 68-74 kg, Cambridge, MA
BLOOD PLASMA; ERYTHROCYTES; URINE; DELIBERATE EXPOSURE; MASSACHUSETTS; ADULTS; SELENIUM; DIETS; TRACE ELEMENTS Janghorbani, M.; Kasper, L.J.; Young, V.R. 1984 American Journal of Clinical Nutrition 40: 208-218				

Tissue	Cases Exposure Route	Range	Mean	General Information
9727 Blood, plasma	Ingestion		a) 0.110+/-0.002 ug/ml b) 0.128+/-0.001 ug/ml S.E.	a) Rural, p=0.0000 b) Urban 21-45 yr age group had highest levels. 73 rural, old order Amish, 82 urban residents, Columbus, Ohio 4-76 yr olds Fluorometry
BLOOD; BLOOD PLASMA; ERYTHROCYTES; ENVIRONMENTAL EXPOSURE; OHIO; AGE; COMPARATIVE EVALUATIONS; SELENIUM; VITAMIN E; BIOLOGICAL MONITORING; DIETS; RURAL AREAS; URBAN AREAS; BIOAVAILABILITY Snook, J.T.; Palmquist, D.L.; Moxon, A.L.; Cantor, A.H.; Vivian, V.M. 1983 American Journal of Clinical Nutrition 38:620-630				

Tissue	Cases Exposure Route	Range	Mean	General Information
9728 Blood, plasma	a) 9 b) 12	a) 11.1+/-0.5-17.2+/-1.5 ug/dl b) Not applicable Range of means S.E.	a) Not applicable b) 15.1+/-0.1 ug/dl S.E.	a) Alcoholics, days 2 and 7 of detoxification b) Controls $p<0.005$ Hospital diet-contained 102+/-4 ug/day. Level by day 7 significantly higher $P<0.01$. Estimated from graph. Acutely inebriated subjects, detox unit, Baltimore, MD. Mean age 47+/-3 yr. Mean duration ethanol consumption 11+/-3 mo Fluorometry
BLOOD PLASMA; URINE; NUTRITIONAL DEFICIENCIES; ALCOHOLISM; ALCOHOLIC BEVERAGES; SELENIUM; MARYLAND; BLOOD CELLS Dutta, S.K.; Miller, P.A.; Greenberg, L.B.; Levander, O.A. 1983 American Journal of Clinical Nutrition 38:713-718				

Selenium
7782-49-2
Se
AtW 78.96, MP 170-217 C, BP 685 C, VP 1 mm Hg at 356 C, 10 mm Hg at 429 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9729 Blood, plasma		a) Not given b) Not given c) Not given	a) 0.106+/-0.013 ug/mL b) 0.127+/-0.027 ug/mL c) 0.115+/-0.012 ug/mL	a) Insulin-treated diabetics b) Non-insulin-treated diabetics c) Control non-diabetics Collected after overnight fasting. Significant differences among all groups. 18-76 yr olds, Oxford, England NA; AAS
BLOOD PLASMA; ENGLAND; DIABETES; METABOLISM; MINERAL METABOLISM; ALUMINUM; ANTIMONY; ARSENIC; BARIUM; BROMINE; CADMIUM; CALCIUM; CESIUM; CHROMIUM; COBALT; COPPER; IODINE; IRON; LEAD; MAGNESIUM; MANGANESE; MERCURY; MOLYBDENUM; NICKEL; RUBIDIUM; SCANDIUM; SELENIUM; SILVER; TIN; VANADIUM; ZINC Ward, N.I.; Pim, B. 1984 Biological Trace Element Research 6:469-487				

Tissue	Cases Exposure Route	Range	Mean	General Information
9730 Blood, serum	128 Ingestion	a) Not given b) Not given c) Not given d) Not given e) Not given f) Not given	a) 50.5+/-12.5 ug/L b) 54.3+/-11.8 ug/L c) 47.7+/-10.3 ug/L d) 54.5+/-13.7 ug/L e) 49.7+/-13.2 ug/L f) 54.1+/-11.3 ug/L	a) 59 males, 69 females, cancer reported in 1972-78 b) Controls (t=2.54, df=127, 2-sided p=0.012) c) 43 (of total), died of cancer d) Controls (t=2.40, df=42, p=0.021) e) 87 (of total), cancers in last 4 yr of followup f) Controls (t=2.27, df=86, p=0.026) Followup of 8113 people, N. Karelia, Kuopio Counties, E. Finland. Surveyed 2-4/72. 31-59 yr olds with no cancers reported in 12 mo pre-1972, cancers in next 6 yr. Matched controls. Study supports previous view that Se-deficiency may be significant in gastrointestinal tract cancers, but does not seem to be associated with cancer risk for skin, bone, urinary, genital cancers. AAS
SELENIUM; BLOOD SERUM; FINLAND; NEOPLASMS; BIOACCUMULATION; NUTRITIONAL DISORDERS; EPIDEMIOLOGY; TRACE ELEMENTS Salonen, J.T.; Alfthan, G.; Huttunen, J.K.; Puska, P. 1984 American Journal of Epidemiology 120(3):342-349				

Tissue	Cases Exposure Route	Range	Mean	General Information
9731 Blood, serum	a) 14 b) 19 c) 8 d) 17	a) 1.12-2.16 ug b) 1.03-1.87 ug c) 1.19-1.96 ug d) 1.01-2.12 ug /g protein	a) 1.50 ug b) 1.48 ug c) 1.57 ug d) 1.53 ug /g protein	A) Controls (spouses), no risk of hereditary nonpolyposis colorectal cancer b) Low risk (no affected parents or grandparents) c) Intermediate risk, 1 affected grandparent d) High risk, 1 affected parent Levels also given according to age groups. No significant differences between risk and controls or between age groups regardless of risk. No correlation between hair and serum levels. 30-60 yr olds, Nebraska NA
BLOOD SERUM; HAIR; NEBRASKA; ADULTS; SELENIUM; GENETIC EFFECTS; COMPARATIVE EVALUATIONS Tempero, M.A.; Jacobs, M.M.; Lynch, H.T.; Graham, C.L.; Blotcky, A.J. 1984 Biological Trace Element Research 6:51-55				

Selenium
7782-49-2
Se
AtW 78.96, MP 170-217 C, BP 685 C, VP 1 mm Hg at 356 C, 10 mm Hg at 429 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9732 Blood, whole	a) 16 b) 32 Ingestion	a) 0.9-2.2 umol/l b) 1.4-2.3 umol/l	a) Not given b) Not given	a) Patients on gluten-free diets b) Controls Estimated from graphs 16 coeliac disease patients, ages 23-71 (mean 50.6) yr and 32 healthy controls, ages 21-74 (mean 49.5) yr Hydride generation; AAS
BLOOD; BLOOD PLASMA; LEUKOCYTES; UNITED KINGDOM; GASTROINTESTINAL DISEASES; NUTRITIONAL DISORDERS; COMPARATIVE EVALUATIONS; SELENIUM; DIETS Hinks, L.J.; Inwards, K.D.; Lloyd, B.; Clayton, B.E. 1984 British Medical Journal 288:1862-1863				

Tissue	Cases Exposure Route	Range	Mean	General Information
9733 Blood, whole	a) 20 b) 28 c) 9 d) 7 e) 17 f) 35 g) 16 Ingestion	a) 0.040-0.245 ug/ml b) 0.020-0.198 ug/ml c) 0.030-0.124 ug/ml d) 0.022-0.164 ug/ml e) 0.023-0.128 ug/ml f) 0.033-0.216 ug/ml g) 0.055-0.248 ug/ml	a) 0.096+/-0.046 ug/ml b) 0.104+/-0.053 ug/ml c) 0.082+/-0.032 ug/ml d) 0.069+/-0.049 ug/ml e) 0.076+/-0.028 ug/ml f) 0.112+/-0.050 ug/ml g) 0.110+/-0.046 ug/ml	a) Seventh-day Adventist vegetarians, men b) Seventh-day Adventist vegetarians, women c) Seventh-day Adventist nonvegetarians, men d) Seventh-day Adventist nonvegetarians, women e) Nonvegetarians, men f) Nonvegetarians, women g) Women with hormone-dependent cancers No significant differences between vegetarians, nonvegetarians or cancer patients. Levels positively correlated with intake of protein, riboflavin, niacin, oleic and linoleic acids but not with 11 other nutrients. Healthy 19-83 yr olds, and 45-79 yr old women, with present or previous malignancies (in remission) of ovary, uterus, breast. Low soil-Se region, OR Fluorometry
OREGON; ADULTS; NEOPLASMS; NUTRITIONAL DEFICIENCIES; BLOOD; SELENIUM; DIETS; FOODS; SOILS Shultz, T.D.; Leklem, J.E. 1983 American Journal of Clinical Nutrition 37:114-118				

Tissue	Cases Exposure Route	Range	Mean	General Information
9734 Brain		a) Not applicable b) Not given	a) 10.5X10(E-7) b) 8.5+/-0.75X10(E-7) g/g dr wt	a) Samples from caudate nucleus of endogeneous psychosis patients b) Normals Tissue samples dissected 20-24 hr after death. 79 yrs old NA
BRAIN; AUTOPSIES; CASE HISTORIES; BEHAVIOR DISORDERS; COBALT; IRON; RUBIDIUM; ALCOHOLIC BEVERAGES; SELENIUM; ZINC Demmel, U.; Hock, A.; Feinendegen, L.E.; Sebek, P. 1984 Science of the Total Environment 38:69-77				

Selenium
7782-49-2
Se
AtW 78.96, MP 170-217 C, BP 685 C, VP 1 mm Hg at 356 C, 10 mm Hg at 429 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9735 Breast	22	a) Not given b) Not given	a) 0.70+/-0.30 ug/g b) 1.02+/-0.43 ug/g	a) Normal tissue b) Neoplastic Dry wt, 3 samples, p=0.003 Patients with primary breast carcinoma, samples of normal and neoplastic tissue obtained at time of mastectomy X-ray fluorescence

BREAST; CALCIUM; VANADIUM; CHROMIUM; MANGANESE; IRON; NICKEL; COPPER; ZINC; ARSENIC; SELENIUM; BROMINE; RUBIDIUM; STRONTIUM; MOLYBDENUM; LEAD; MERCURY; NEOPLASMS
Rish, S.L.; Shy-Peck, H.H. 1984 Cancer Research 44:5390-5394

Tissue	Cases Exposure Route	Range	Mean	General Information
9736 Cerebrospinal fluid	a) 10 b) 6 c) 3 d) 6 e) 3 f) 1 g) 1	a) Not given b) Not given c) Not given d) Not given e) Not given f) Not given g) Not given	a) 19.1+/-13.3 ug/l b) 19.1+/-5.6 ug/l c) 18.4+/-4.1 ug/l d) 23.8+/-1.6 ug/l e) 85.1+/-13.5 ug/l f) 154 ug/l g) 157 ug/l	a) Controls, non-neoplasmic diseases (hydrocephalus, etc.) b) Meningioma c) Craniopharyngioma d) Astrocytoma e) Medulloblastoma f) Pinealblastoma g) Chondrosarcoma b, c) Benign brain tumors, (d-g) malignant brain tumors Significant differences between malignant tumor and control groups ($p<0.047$), and between malignant and benign tumor groups ($p<0.014$). Relationship, if any, to malignancy unknown. Patients, 18 men, 14 women, range of mean ages 4.6-55.0 yr, fasted 8-12 hr AAS

CEREBROSPINAL FLUID; SAUDI ARABIA; CARCINOMAS; NEOPLASMS; SARCOMAS; ALUMINUM; ANTIMONY; BISMUTH; CADMIUM; COPPER; GOLD; LEAD; SELENIUM; SILVER
El-Yazigi, A.; Al-Saleh, I.; Al-Mefty, O. 1984 Clinical Chemistry 30:1358-1360

Tissue	Cases Exposure Route	Range	Mean	General Information
9737 Hair	9	0.300-0.731 ppm	0.47 ppm	Two scalp sites/person, levels > blood but < toenails. High values (range of 5.76-87.8 ppm) from persons using Se-containing shampoo excluded. Adults, Boston, MA NA

BLOOD; HAIR; NAILS; GEORGIA; MASSACHUSETTS; NEW ZEALAND; SOUTH DAKOTA; DIETS; SELENIUM; BIOINDICATORS; COMPARATIVE EVALUATIONS
Morris, J.S.; Stampfer, M.J.; Willett, W. 1984 Biological Trace Element Research 5:529-537

Selenium
7782-49-2
Se
AtW 78.96, MP 170-217 C, BP 685 C, VP 1 mm Hg at 356 C, 10 mm Hg at 429 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9736 Hair	12 Ingestion	Not given	0.86 ug/g	Positively correlated with hair Hg ($r=0.7524$, $p<0.05$) and blood Hg ($r=0.5872$, $p<0.5$). Hair is not good index of Se uptake. Residents of Angmagssalik, East Greenland AAS
BLOOD; HAIR; ENVIRONMENTAL EXPOSURE; DENMARK; GREENLAND; AGE; MERCURY; SELENIUM; DIETS; BIOACCUMULATION Hansen, J.C.; Kromann, N.; Wulf, H.C.; Alboge, K. 1984 Science of the Total Environment 38:33-40				

Tissue	Cases Exposure Route	Range	Mean	General Information
9739 Hair		a) Not given b) Not given c) Not given	a) 3-4 ug/g b) 0.07 ug/g c) 0.085 ug/g	a) Japan b) China (Kershán) c) Greece Most countries, levels are of order of 0.5-1 ug/g. Levels from database containing data on "normal" levels of 15 elements in 7 tissues/fluids. Data selected by 60 investigators in over 40 countries. Diet, environment both important in distribution of elements.
ZINC; COPPER; MANGANESE; SELENIUM; LEAD; CADMIUM; BLOOD; BLOOD SERUM; HAIR; MILK; BANGLADESH; INDIA; TURKEY; FINLAND; ITALY; NEW ZEALAND; GUATEMALA; CHILE; SWEDEN; HUNGARY; YUGOSLAVIA; POLAND; KENYA; EGYPT; SOUTH AFRICA; UNITED STATES; AUSTRALIA; GREECE; PAKISTAN; NIGERIA; PHILIPPINES; ZAIRE; THAILAND; CHINA; WYOMING; OHIO; CALIFORNIA; JAPAN; MEXICO; CANADA; ISRAEL; PERU; SPAIN; COMPARATIVE EVALUATIONS; BIOLOGICAL MONITORING; IRAN; DIETS; ENVIRONMENTAL EXPOSURE Iyengar, G.V. 1984 Science of the Total Environment 38:125-131				

Tissue	Cases Exposure Route	Range	Mean	General Information
9740 Hair	a) 11 b) 7 c) 10	a) 0.03-2.35 ug b) 0.28-1.44 ug c) 0.54-2.67 ug /g dry wt	a) 0.93 ug b) 0.75 ug c) 1.13 ug /g dry wt	a) Controls (spouses), no risk of hereditary nonpolyposis colorectal cancer b) Low risk (no affected parents or grandparents) c) High risk, 1 affected parent No significant differences between risk and controls. No correlation between hair and serum levels 30-60 yr olds, Nebraska Spectrofluorimetry
BLOOD SERUM; HAIR; NEBRASKA; ADULTS; SELENIUM; GENETIC EFFECTS; COMPARATIVE EVALUATIONS Tempero, M.A.; Jacobs, M.M.; Lynch, H.T.; Graham, C.L.; Blotcky, A.J. 1984 Biological Trace Element Research 6:51-56				

Selenium
7782-49-2
Se
AtW 78.96, MP 170-217 C, BP 685 C, VP 1 mm Hg at 356 C, 10 mm Hg at 429 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9741 Hair	a) 31 b) 45 c) 26 d) 14	a) 80-4500 ug/kg b) 60-2100 ug/kg c) 70-2800 ug/kg d) 110-1700 ug/kg	a) 340 ug/kg b) 320 ug/kg c) 450 ug/kg d) 350 ug/kg	a) Caucasian boys b) Caucasian girls c) Hindustani children d) Creal, Chinese, and Javanese subjects, migrated from Surinam 5 g scalp hair from occipital region. 6 yr old school children living in Amsterdam suburb NA; AAS

HAIR; ENVIRONMENTAL EXPOSURE; NETHERLANDS; CHILDREN; SEX; BIOACCUMULATION; BIOLOGICAL MONITORING; DIETS; COPPER; ZINC; LEAD; IRON; CADMIUM; SELENIUM; COBALT; SILVER; GOLD

Herber, R.P.M.; Wibowo, A.A.E.; Das, H.A.; Egger, R.J.; van Deyck, W.; Zielhuis, R.L. 1983 International Archives of Occupational and Environmental Health 53:127-137

Tissue	Cases Exposure Route	Range	Mean	General Information
9742 Hair	6	a) 0-3.0 ug/g b) 4.5-21 ug/g c) 9.0-25 ug/g d) 2.0-26 ug/g e) 2.0-9.5 ug/g f) 0-4.5 ug/g Estimated from figure	a) 1.5 ug/g b) 10.0 ug/g c) 12.0 ug/g d) 11.0 ug/g e) 7.5 ug/g f) 0.55 ug/g	a) 0-40 cm from scalp, 7 yr old female b) 0-40 cm from scalp, 4 yr old female c) 0-30 cm from scalp, 7 yr old female d) 0-18 cm from scalp, 3 yr old female e) 0-15 cm from scalp, 2 yr old male f) 0-65 cm from scalp, 40 yr old female Range from total length, mean from 1st 10 cm from scalp. Levels not uniform throughout same hair of same person, no definite pattern discernible. Japan NA

HAIR; ENVIRONMENTAL EXPOSURE; JAPAN; ADULTS; CHILDREN; COMPARATIVE EVALUATIONS; BROMINE; CALCIUM; CHLORINE; COPPER; IODINE; MAGNESIUM; MANGANESE; MERCURY; SELENIUM; ZINC; BIOINDICATORS

Yukawa, M.; Suzuki-Yasumoto, M.; Tanaka, S. 1984 Science of the Total Environment 38:41-54

Tissue	Cases Exposure Route	Range	Mean	General Information
9743 Kidney	52		4.0+/-1.3 ug/g Dry wt	Cortex. No significant relationship to age. Cd and Cd/Se positively correlated with postmortem evidence of hypertension only if age, gender not included in multiple regression equation. 16-60 yr old Caucasians autopsied in 1979-1981. Also measured: heart wt, body wt, height. Selected from group of 60. Cancer, kidney failure, extensive wt loss cases excluded. West Virginia Fluorimetry

SELENIUM; CADMIUM; ZINC; COPPER; AUTOPSIES; KIDNEYS; WEST VIRGINIA; HYPERTENSION; TRACE ELEMENTS

Horvath, D.J.; Barker, F.W.; Thayne, W.V.; Frost, J.L. 1984 Biological Trace Element Research 6:225-236

Selenium
7782-49-2
Se
AtW 78.96, MP 170-217 C, BP 685 C, VP 1 mm Hg at 356 C, 10 mm Hg at 420 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9744 Liver	56	a) 0.34-0.68 ug/g b) 0.34-0.687 ug/g c) 0.35-0.53 ug/g d) 0.38-0.65 ug/g e) 0.30-0.64 ug/g	a) 0.52 ug/g b) 0.51 ug/g c) 0.44 ug/g d) 0.56 ug/g e) 0.51 ug/g	a) 1 sample per liver (56), AAS b) 2 samples from 35 livers, 1 from 1, NA c) 8 samples, Baltimore, MD d) 13 samples, Seattle, WA e) 15 samples, Minneapolis, MN Normal tissues from autopsies For c), d) and e), ranges estimated from figure. Geographic dependency noted. Baltimore, MD; Minneapolis, MN, Seattle, WA AAS; NA

LIVER; ENVIRONMENTAL EXPOSURE; AUTOPSIES; COMPARATIVE EVALUATIONS; MEASUREMENT METHODS; ALUMINUM; CADMIUM; COPPER; LEAD; MANGANESE; SELENIUM; ZINC
Zeisler, R.; Harrison, S.H.; Wise, S.A. 1984 Biological Trace Element Research 6:31-49

Tissue	Cases Exposure Route	Range	Mean	General Information
9745 Liver	98	a) 0.13-0.45 mg/kg b) 0.14-0.53 mg/kg	a) 0.25+/-0.06 mg/kg b) 0.33+/-0.15 mg/kg	a) Females b) Males Autopsies. Levels generally lower than those in other countries. No major regional variations. New Zealanders. Death by physical injuries Chem

LIVER; COMPARATIVE EVALUATIONS; ARSENIC; CADMIUM; CHROMIUM; COBALT; COPPER; NEW ZEALAND; AUTOPSIES; LEAD; MANGANESE; MERCURY; NICKEL; SELENIUM; SILVER; ZINC
Pickston, L.; Lewin, J.P.; Drysdale, J.M.; Smith, J.M.; Bruce, J. 1968 Journal of Analytical Toxicology 7:2-6

Selenium
7782-49-2
Se
AtW 78.96, MP 170-217 C, BP 685 C, VP 1 mm Hg at 356 C, 10 mm Hg at 429 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9746 Milk		a) Not given b) Not given c) Not given d) Not given e) Not given f) Not given g) Not given h) Not given	a) 33 ng/ml b) 31 ng/ml c) 62 ng/ml d) 12 ng/ml e) 10 ng/ml f) 13 ng/ml g) 10 ng/ml h) 11 ng/ml	a) Phillipines b) UK c) Chile d) Australia e) New Zealand f) Ohio g) Finland h) Hungary Other countries range from 15-25 ng/ml. Levels from database containing data on "normal" levels of 15 elements in 7 tissues/fluids. Data selected by 60 investigators in over 40 countries. Diet, environment both important in distribution of elements.

ZINC; COPPER; MANGANESE; SELENIUM; LEAD; CADMIUM; BLOOD; BLOOD SERUM; HAIR; MILK; BANGLADESH; INDIA; TURKEY; FINLAND; ITALY; NEW ZEALAND; GUATEMALA; CHILE; SWEDEN; HUNGARY; YUGOSLAVIA; POLAND; KENYA; EGYPT; SOUTH AFRICA; UNITED STATES; AUSTRALIA; GREECE; PAKISTAN; NIGERIA; PHILIPPINES; ZAIRE; THAILAND; CHINA; WYOMING; OHIO; CALIFORNIA; JAPAN; MEXICO; CANADA; ISRAEL; PERU; SPAIN; COMPARATIVE EVALUATIONS; BIOLOGICAL MONITORING; IRAN; DIETS; ENVIRONMENTAL EXPOSURE

Iyengar, G.V. 1984 Science of the Total Environment 36:125-131

Tissue	Cases Exposure Route	Range	Mean	General Information
9747 Milk	a) 12 b) 15 c) 6	a) 64-125 ug/kg b) 43-151 ug/kg c) 40.2-80 ug/kg Dry wt	a) 94+/-24 ug/kg b) 82+/-29 ug/kg c) 64+/-14 ug/kg Dry wt	a) Colostrum (1st or 2nd day post partum) b) Transitional milk (3-8 days post partum) c) Mature milk (1-8 mo post partum) Slovenia, Yugoslavia NA

MILK; ARSENIC; CADMIUM; COBALT; COPPER; MERCURY; IODINE; MANGANESE; ANTIMONY; SELENIUM; VANADIUM; ZINC; YUGOSLAVIA; ENVIRONMENTAL EXPOSURE

Kosta, L.; Byrne, A.R.; Dermelj, M. 1983 Science of the Total Environment 29:261-268

Tissue	Cases Exposure Route	Range	Mean	General Information
9748 Nail	a) 15 b) 24 c) 9 d) 14	a) 60-172 ug/g (or ppm) b) 53-112 ug/g c) 60-90 ug/g d) 8-40 ug/g Estimated from figure	a) 1.17 ug/g (or ppm) b) 0.81 ug/g c) 0.74 ug/g d) 0.26 ug/g	a) South Dakota b) Georgia c) Boston, MA, levels higher than in blood or hair d) New Zealand 10 toenail samples/subject Adults NA

BLOOD; HAIR; NAILS; GEORGIA; MASSACHUSETTS; NEW ZEALAND; SOUTH DAKOTA; DIETS; SELENIUM; BIOINDICATORS; COMPARATIVE EVALUATIONS

Morris, J.S.; Stampfer, M.J.; Willett, W. 1984 Biological Trace Element Research 5:529-537

Selenium
7782-49-2
Se
AtW 78.96, MP 170-217 C, BP 685 C, VP 1 mm Hg at 356 C, 10 mm Hg at 429 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9749 Urine	a) 12 b) 15 Ingestion	a) Not given b) Not given	a) 48+/-2 ug/d b) 59+/-1 ug/d S.E.	a) Males b) Females Sampled during 4 1-wk metabolic periods over 1 yr. $p<0.05$. 1 ug/kg body wt needed daily to maintain balance. Subjects selected for regular eating habits, non-vegetarian diets, no dietary supplements. Beltsville, MD area, 19-50 yr Fluorometry
BLOOD PLASMA; URINE; MARYLAND; ADULTS; SELENIUM; DIETS; METABOLISM Levander, O.A.; Morris, V.C. 1984 American Journal of Clinical Nutrition 39:809-815				

Tissue	Cases Exposure Route	Range	Mean	General Information
9750 Urine	4 Ingestion	a) Not given b) Not given	a) 44+/-3 ug/d b) 27+/-5 ug/d	a) 1-10 d on diet with 107.7+/-0.1 ug Se/d b) 11-46 d on diet with 11.4+/-0.1 ug Se/d Controlled, nutritionally complete diet. In addition, received 108.8 ug Se-74 on d 4 and d 39, fasting before and after. Healthy Massachusetts Institute of Technology students, 19-20 yr old, 63-74 kg, Cambridge, MA
BLOOD PLASMA; ERYTHROCYTES; URINE; DELIBERATE EXPOSURE; MASSACHUSETTS; ADULTS; SELENIUM; DIETS; TRACE ELEMENTS Janghorbani, M.; Kasper, L.J.; Young, V.R. 1984 American Journal of Clinical Nutrition 40: 208-218				

Tissue	Cases Exposure Route	Range	Mean	General Information
9751 Urine	a) 7 b) 6	a) 17-51 ug/d b) 11-60 ug/d c) 36-63 ug/d S.E.	a) Not given b) Not given c) Not given	a) Alcoholics, day 2 of hospitalization $p<0.005$ b) Day 7, $p<0.005$ c) Controls Estimated from graph. Acutely inebriated subjects, detox unit, Baltimore, MD. Mean age 47+/-8 yr. Mean duration ethanol consumption 11+/-3 mo Fluorometry
BLOOD PLASMA; URINE; NUTRITIONAL DEFICIENCIES; ALCOHOLISM; ALCOHOLIC BEVERAGES; SELENIUM; MARYLAND; BLOOD CELLS Dutta, S.K.; Miller, P.A.; Greenberg, L.B.; Levander, O.A. 1983 American Journal of Clinical Nutrition 38:713-718				

Silicon
7440-21-3
Si
AtW 28.086, MP 1410 C, BP 2600 C, VP 1 mm Hg at 1724 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9752 Aorta	a) 8 b) 6 c) 7	a) 69-150 ppm b) 58-79 ppm c) Not given Dry wt	a) Not given b) Not given c) 344+/-22 ppm Dry wt	a) Sclerotic aorta from metal-workers b) Normal aorta from metal-workers c) Notmal aorta from non metal-workers 45-66 yr old workers. Autopsies, Japan, 1976-1977. Employed 7-32 yr ES
9753 Bone	1	Not given	<10 ppm Dry wt	Lumbar vertebrae (n=5). Chromate plating worker, employed 7 yr, died at age 66, 30 yr after changing jobs ES

AORTA; VERTEBRAE; BONES; ENVIRONMENTAL EXPOSURE; OCCUPATIONAL EXPOSURE; JAPAN; AUTOPSIES; CADAVERS; CARDIOVASCULAR DISEASES; MINERALS; BIOACCUMULATION; DIETS; FOODS; MINERAL DEPOSITS; CALCIUM; PHOSPHORUS; IRON; MAGNESIUM; ZINC; ALUMINUM; COPPER; CADMIUM; LEAD; NICKEL; VANADIUM; CHROMIUM; MANGANESE; SILICON; TIN; TITANIUM; STRONTIUM

Teraoka, H. 1984 Archives of Environmental Contamination and Toxicology 13:119-127

Tissue	Cases Exposure Route	Range	Mean	General Information
9754 Lung	a) 10 b) 17 c) 14 d) 22	a) <0.2 b) <0.2 c) <0.2 d) <0.2-6.1 Si/S ratio	a) Not given b) Not given c) Not given d) Not given	a) Autopsies, men, ages 26-67 yr (mean 57), no exposure to silica, no active pulmonary disease, death from nonpulmonary causes b) Biopsies, 16 men, 1 woman, ages 25-67 (mean 50), no exposure, had bilateral interstitial pulmonary disease c) 6 autopsies, 8 biopsies, men, ages 26-62 (mean 56), various sources of silica dust (>5 yr), no silicosis d) 11 autopsies, 11 biopsies, men, ages 44-85 (mean 63), silicosis, various sources of silica dust, values <0.2 experimental error Silicosis X-ray analysis

LUNGS; OCCUPATIONAL EXPOSURE; ENVIRONMENTAL EXPOSURE; ADULTS; RESPIRATORY DISEASES; BIOPSIES; AUTOPSIES; MEASUREMENT METHODS; SILICON

Funahashi, A.; Schlueter, D.P.; Siegesmund, K.A. 1984 Chest 85(4):506-509

Silver
7440-22-4
Ag
AtW 107.868, MP 960.5 C, BP 2000 C, VP 1 mm Hg at 1510 C, 10 mm Hg at 1540 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9755 Blood, plasma		a) Not given b) Not given c) Not given	a) 0.0018+/-0.0003 ug/mL b) 0.0019+/-0.0005 ug/mL c) 0.0020+/-0.0004 ug/mL	a) Insulin-treated diabetics b) Non-insulin-treated diabetics c) Control non-diabetics Collected after overnight fasting. Significant difference between a) and c). 18-78 yr olds, Oxford, England NA; AAS

BLOOD PLASMA; ENGLAND; DIABETES; METABOLISM; MINERAL METABOLISM; ALUMINUM; ANTIMONY; ARSENIC; BARIUM; BROMINE; CADMIUM; CALCIUM; CESIUM; CHROMIUM; COBALT; COPPER; IODINE; IRON; LEAD; MAGNESIUM; MANGANESE; MERCURY; MOLYBDENUM; NICKEL; RUBIDIUM; SCANDIUM; SELENIUM; SILVER; TIN; VANADIUM; ZINC

Ward, N.I.; Pim, B. 1984 Biological Trace Element Research 6:469-487

Tissue	Cases Exposure Route	Range	Mean	General Information
9756 Cerebrospinal fluid	a) 10 b) 8 c) 8 d) 6 e) 5 f) 1 g) 1	a) Not given b) Not given c) Not given d) Not given e) Not given f) Not given g) Not given	a) 5.1+/-2.9 ug/l b) 5.9+/-4.6 ug/l c) 9.1+/-8.0 ug/l d) 11.1+/-7.7 ug/l e) 12.4+/-4.8 ug/l f) 21.5 ug/l g) 4.0 ug/l	a) Controls, non-neoplasmic diseases (hydrocephalus, etc.) b) Meningioma c) Craniopharyngioma d) Astrocytoma e) Medulloblastoma f) Pinealblastoma g) Chondrosarcomma b, c) Benign brain tumors, (d-g) malignant brain tumors Significant difference ($p<0.012$) between malignant tumor and control groups. Relationship, if any, to malignancy unknown. Patients, 18 men, 14 women, range of mean ages 4.6-55.0 yr, fasted 8-12 hr AAS

CEREBROSPINAL FLUID; SAUDI ARABIA; CARCINOMAS; NEOPLASMS; SARCOMAS; ALUMINUM; ANTIMONY; BISMUTH; CADMIUM; COPPER; GOLD; LEAD; SELENIUM; SILVER

El-Yazigi, A.; Al-Saleh, I.; Al-Mefty, O. 1984 Clinical Chemistry 30:1558-1560

Tissue	Cases Exposure Route	Range	Mean	General Information
9757 Hair	a) 26 b) 46 c) 24 d) 17	a) 60-1500 ug/kg b) 40-2500 ug/kg c) 30-1300 ug/kg d) 50-580 ug/kg	a) 140 ug/kg b) 350 ug/kg c) 90 ug/kg d) 140 ug/kg	a) Caucasian boys b) Caucasian girls c) Hindustani children d) Creol, Chinese, and Javanese subjects, migrated from Surinam 5 g scalp hair from occipital region. 8 yr old school children living in Amsterdam suburb NA; AAS

HAIR; ENVIRONMENTAL EXPOSURE; NETHERLANDS; CHILDREN; SEX; BIOACCUMULATION; BIOLOGICAL MONITORING; DIETS; COPPER; ZINC; LEAD; IRON; CADMIUM; SELENIUM; COBALT; SILVER; GOLD

Herber, R.F.M.; Wibowo, A.A.E.; Das, H.A.; Egger, R.J.; van Deyck, W.; Zielhuis, R.L. 1983 International Archives of Occupational and Environmental Health 53:127-137

Silver
7440-22-4
Ag
AtW 107.868, MP 960.5 C, BP 2000 C, VP 1 mm Hg at 1310 C, 10 mm Hg at 1540 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9758 Liver	96	a) <0.01-0.06 mg/kg b) <0.01-0.06 mg/kg	a) 0.04+/-0.03 mg/kg b) 0.04+/-0.03 mg/kg	a) Females b) Males Autopsies. Levels generally lower than those in other countries. No major regional variations.
				New Zealanders. Death by physical injuries AAS

LIVER; COMPARATIVE EVALUATIONS; ARSENIC; CADMIUM; CHROMIUM; COBALT; COPPER; NEW ZEALAND; AUTOPSIES; LEAD; MANGANESE; MERCURY; NICKEL; SELENIUM; SILVER; ZINC
Pickston, L.; Lewin, J.P.; Dryedale, J.M.; Smith, J.M.; Bruce, J. 1983 Journal of Analytical Toxicology 7:2-6

Sodium
7440-23-5
Na
AtW 22.98977, MP 97.82 C, BP 881.4 C, VP 1 mm Hg at 440 C, 10 mm Hg at 546 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9759 Blood, serum	a) 30 b) 54 c) 105	a) Not given b) 137.3+/-1.6-141+/-2.6 mmol/L c) 138.3+/-3.1-134.8+/-2.5 mmol/L S.E.	a) 132.4+/-1.0 mmol/L b) Not given c) Not given S.E.	a) Controls b) Patients with hypertension, old myocardial infarctions c) Others Significant difference, a) and b). Ranges of means b) and c) Controls from group 30-56 yr olds, 24% family history of ischemia. 49 males, 5 females (diseases in b)) from 53-84 yr olds, 57% smokers, 22% family history of ischemia. Others, different heart diseases Flame photometry

BLOOD SERUM; HEART DISEASES; HYPERTENSION; TRACE ELEMENTS; COPPER; ZINC; IRON; NICKEL; COBALT; SODIUM; POTASSIUM; CALCIUM; MAGNESIUM; PAKISTAN; COMPARATIVE EVALUATIONS; CHOLESTEROLS
Khan, S.N.; Rahman, M.A.; Samad, A. 1984 Clinical Chemistry 30(5):644-648

Tissue	Cases Exposure Route	Range	Mean	General Information
9760 Blood, serum	1 Ingestion	a) Not given b) Not given c) Not given	a) 210 mmol/l b) 175 mmol/l c) 155 mmol/l	a) At admission b) 36 hr later c) 3 days later Dose, 8-10 tablespoons/day, 10 days, for mild abdominal pain. Levels normal by day 4.
				2 yr old girl, IL Fever, vomiting, lethargy, gait imbalance, dehydration, dry mucous membranes, hyperglycemia.

ILLINOIS; CASE HISTORIES; CHILDREN; BLOOD; SODIUM; ACCIDENTAL POISONING; DRUGS; DELIBERATE EXPOSURE
Puczynski, M.S.; Cunningham, D.G.; Mortimer, J.C. 1983 Journal of the Canadian Medical Association 128(7):821-822

Sodium
7440-23-5
Na
AtW 22.98977, MP 97.82 C, BP 881.4 C, VP 1 mm Hg at 440 C, 10 mm Hg at 546 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9761 Hair	a) 69 b) 51 c) 5 d) 13	a) Not given b) Not given c) Not given d) Not given	a) 1658+/-3.5 ug/g b) 2012+/-2.9 ug/g c) 1438+/-2.2 ug/l d) 819+/-5.7 ug/g Geometric means	a) Total, unwashed hair samples b) Hair pieces c) Needle pads d) Others (undefined) Unwashed samples, levels highest of 12 elements. No significant difference among sample types but levels higher ($p<0.01$) in samples from 1880-1949 than from 1950-1969. After working (non-ionic surface active agent), no difference between 1911-1966 samples and 1981-1985. Japanese women. 1981-1985 samples from 22 workers at National Institute of Environmental Studies AAS
HAIR; ENVIRONMENTAL EXPOSURE; JAPAN; COMPARATIVE EVALUATIONS; CALCIUM; COPPER; IRON; LEAD; MAGNESIUM; MANGANESE; MERCURY; MERCURY ORGANIC COMPOUNDS; METALS; MINERALS; PHOSPHORUS; POTASSIUM; SODIUM; STRONTIUM; TRACE ELEMENTS; ZINC; OCCUPATIONAL EXPOSURE Suzuki, T.; Hongo, T.; Morita, M.; Yamamoto, R. 1986 Science of the Total Environment 39:81-91				

Tissue	Cases Exposure Route	Range	Mean	General Information
9762 Urine	56 Ingestion	a) Not given b) Not given c) Not given d) Not given e) Not given f) Not given	a) 98+/-43 mmol b) 115+/-37 mmol c) 83+/-30 mmol d) 114+/-67 mmol e) 127+/-74 mmol f) 90+/-48 mmol /24 hr	a) Volunteers b) 20 males c) 18 Females d) Stone-formers e) 11 Males f) 7 females Diet contained 400 mg Ca/d. Significant correlation between urinary excretion of Ca and Na in normal volunteers 36 healthy volunteers, normal renal function, mean age 37.2+/-11.9 yr, 18 recurrent stone formers, no demonstrable cause, mean age 28.6+/-10.5 yr
URINE; AUSTRALIA; ADULTS; CALCIUM; SODIUM; DELIBERATE EXPOSURE; DIETS; Sabto, J.; Powell, M.J.; Breidahl, M.J.; Gurr, F.W. 1986 Medical Journal of Australia 140:354-356				

Tissue	Cases Exposure Route	Range	Mean	General Information
9763 Urine	a) 12 b) 16 Ingestion	a) Not given b) Not given	a) 3.4+/-0.1 g/d b) 2.4+/-0.1 g/d S.E.	a) Males b) Females Means, composites of 24-hr samples taken for 7 d, 4x/yr. Sex difference reflection of difference in energy intake. Ratio of Na-K intake probably more important than intake of either. Healthy 20-53 yr olds, taking no vitamin or mineral supplements AAS
URINE; SODIUM; POTASSIUM; DIETS; ADULTS; MINERAL METABOLISM Holbrook, J.R.; Patterson, K.Y.; Bodner, J.E.; Douglas, L.W.; Veillon, C.; Kelsay, J.L.; Mertz, W.; Smith, J.C., Jr. 1984 American Journal of Clinical Nutrition 40:786-793				

Sodium
7440-23-5
Na
AtW 22.98977, MP 97.82 C, BP 881.4 C, VP 1 mm Hg at 440 C, 10 mm Hg at 546 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9764 Urine	9	a) Not given b) Not given	a) 4217+/-1679 mg/d b) 3992+/-1268 mg/d	a) Day of 6 mi run b) Non-run day No significant difference ($p<0.05$). Fasted from 10 hr before to 2 hr after run. Also measured phosphate. 23-46 yr old male runners AAS
BLOOD SERUM; URINE; CALCIUM; CHROMIUM; COPPER; POTASSIUM; SODIUM; ZINC; TRACE ELEMENTS; ADULTS Anderson, R.A.; Polansky, M.M.; Bryden, N.A. 1984 Biological Trace Element Research 6:327-336				

Sodium, ion (Na(1+))
17341-25-2
Na
AtW 22.98977

Tissue	Cases Exposure Route	Range	Mean	General Information
9765 Blood, plasma	14 Ingestion	a) Not given b) Not given c) Not given d) Not given e) Not given f) Not given g) Not given h) Not given	a) 140+/-3 mmol b) 138+/-2 mmol c) 136+/-2 mmol d) 138+/-3 mmol e) 135+/-2 mmol f) 139+/-2 mmol g) 135+/-2 mmol h) 141+/-2 mmol S.E.	a) Infants fed mothers' milk, start of study, 7 cases b) At 1 wk, 7 cases c) At 2 wk, 7 cases d) At 4 wk, 5 cases e) Infants fed formula, start of study, 7 cases f) At 1 wk, 7 cases g) At 2 wk, 6 cases h) At 4 wk (+ supplements NaHCO3, Ca-lactate), 5 cases Hyponatremia (plasma NA <128 mmol/l) in 1 infant from each group. Premature infants, birth wt <1.3 kg, mean gestation time 28 wk, Canada Flame photometry
9766 Milk	7	a) Not given b) Not given c) Not given	a) 17.4+/-1.50 mmol b) 12.5+/-0.60 mmol c) 11.2+/-0.60 mmol S.E.	a) 6-8 days postpartum b) 13-15 days postpartum c) 26-28 days postpartum Mothers of premature infants. Infant birth wt <1.3 kg, mean gestational age 28 wk, Canada Flame photometry
PREMATURE INFANTS; CANADA; NUTRITIONAL DEFICIENCIES; BLOOD PLASMA; MILK; COMPARATIVE EVALUATIONS; CALCIUM; MAGNESIUM; MINERALS; PHOSPHORUS; POTASSIUM; SODIUM; FOODS; LACTATION; DELIBERATE EXPOSURE Atkinson, S.A.; Radde, I.C.; Anderson, G.H. 1983 Journal of Pediatrics 102(1):99-106				

Sodium, ion (Na(1+))

17341-25-2
Na
AtW 22.98977

Tissue	Cases Exposure Route	Range	Mean	General Information
9767 Urine	15 Ingestion	a) 6-14 mEq/hr b) 1.25-3.25 Eq/hr Ranges of mean	a) Not applicable b) Not applicable	a) Controls, basal and 0-8 hr P<0.05 8 mEq/hr in 24-48 hr pool b) Patients, basal and 8-24 hr. P<0.05. 1.5 mEq/hr in 48-72 hr pool Single 200 mg oral dose of triamterene. Estimated from graph. 8 controls, 30+/-2 yrs old, 60+/-4 kg. 7 alcoholic cirrhosis patients, 55+/-3 yrs old, 54+/-5 kg HPLC
BLOOD PLASMA; URINE; DELIBERATE EXPOSURE; CIRRHOSIS; DIURETICS; POTASSIUM Villeneuve, J.P.; Rocheleau, P.; Raymond, G. 1984 Clinical Pharmacology and Therapeutics 35(6):831-837				

Strontium

7440-24-6
Sr
AtW 87.62, MP 357 C, BP 1366 C, VP 10 mm Hg at 896 C, 1 mm Hg at 740 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9768 Aorta	a) 8 b) 6 c) 7	a) 19-28 ppm b) 1.9-5.0 ppm c) Not given Dry wt	a) Not given b) Not given c) 2.1+/-0.66 ppm Dry wt	a) Sclerotic aorta from metal-workers b) Normal aorta from metal-workers c) Normal aorta from non metal-workers 45-66 yr old workers. Autopsies, Japan, 1976-1977. Employed 7-32 yr ES
9769 Bone	1	Not given	22+/-7.5 ppm Dry wt	Lumbar vertebrae (n=5). Chromate plating worker, employed 7 yr, died at age 66, 30 yr after changing jobs ES
AORTA; VERTEBRAE; BONES; ENVIRONMENTAL EXPOSURE; OCCUPATIONAL EXPOSURE; JAPAN; AUTOPSIES; CADAVERS; CARDIOVASCULAR DISEASES; MINERALS; BIOACCUMULATION; DIETS; FOODS; MINERAL DEPOSITS; CALCIUM; PHOSPHORUS; IRON; MAGNESIUM; ZINC; ALUMINUM; COPPER; CADMIUM; LEAD; NICKEL; VANADIUM; CHROMIUM; MANGANESE; SILICON; TIN; TITANIUM; STRONTIUM Terashe, H. 1984 Archives of Environmental Contamination and Toxicology 13:119-127				

Tissue	Cases Exposure Route	Range	Mean	General Information
9770 Breast	22	a) Not given b) Not given	a) 1.29+/-0.70 ug/g b) 1.48+/-1.18 ug/g	a) Normal tissue b) Neoplastic Dry wt, 3 samples, p=0.25 Patients with primary breast carcinoma, samples of normal and neoplastic tissue obtained at time of mastectomy X-ray fluorescence
BREAST; CALCIUM; VANADIUM; CHROMIUM; MANGANESE; IRON; NICKEL; COPPER; ZINC; ARSENIC; SELENIUM; BROMINE; RUBIDIUM; STRONTIUM; MOLYBDENUM; LEAD; MERCURY; NEOPLASMS Rizk, S.L.; Sky-Peck, H.H. 1984 Cancer Research 44:5390-5394				

Strontium
7440-24-6
Sr
AtW 87.62, MP 357 C, BP 1366 C, VP 10 mm Hg at 896 C, 1 mm Hg at 740 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9771 Hair	a) 69 b) 50 c) 5 d) 13	a) Not given b) Not given c) Not given d) Not given	a) 6.2+/-1.7 ug/g b) 8.7+/-1.7 ug/g c) 4.7+/-2.3 ug/g d) 7.9+/-1.6 ug/g Geometric means	a) Total, unwashed hair samples b) Hair pieces c) Needle-pads d) Others (undefined) In unwashed samples, no significant difference between sample types but levels higher ($p<0.01$) in samples from 1880-1940 than from 1950-1969. After washing (non-ionic SAA), no difference between 1911-1968 samples and 1981-1983. Japanese women. 1981-1983 samples from 22 workers at National Institute of Environmental Studies Atomic emission spectrometry; AAS
HAIR; ENVIRONMENTAL EXPOSURE; JAPAN; COMPARATIVE EVALUATIONS; CALCIUM; COPPER; IRON; LEAD; MAGNESIUM; MANGANESE; MERCURY; MERCURY ORGANIC COMPOUNDS; METALS; MINERALS; PHOSPHORUS; POTASSIUM; SODIUM; STRONTIUM; TRACE ELEMENTS; ZINC; OCCUPATIONAL EXPOSURE Suzuki, T.; Hongo, T.; Morita, M.; Yamamoto, R. 1984 Science of the Total Environment 39:81-91				

Styrene (8 CI); Benzene, ethenyl- (9 CI)
100-42-5
C8-H8
MW 104.14, MP -31 C, BP 145-146 C, VP 39.4 atm at 374.4 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9772 Blood	a) 6 b) 4 c) 6 d) 6 Inhalation	a) 450-750 ug/l b) 1100-1600 ug/l c) 1350-3700 ug/l d) 700-3100 ug/l	a) 573 ug/l b) 1425 ug/l c) 2575 ug/l d) 1517 ug/l	a) Solid waste container workers b) Duckboard workers c) Tank cylinder workers d) Tank finishing workers Mean air levels, 120-684 ul/l Styrenemia averaged 3.8-4.9 X higher than styrene in air. Workers, fiberglass reinforced plastic factory GC
BLOOD; URINE; OCCUPATIONAL EXPOSURE; COMPARATIVE EVALUATIONS; STYRENES; AIR POLLUTION; BIOLOGICAL MONITORING; INHALATION; METABOLITES Apostoli, P.; Brugnone, F.; Perbellini, L.; Cocheo, V.; Bellomo, M.L.; Silvestri, R. 1984 American Journal of Industrial Medicine 4:741-754				

Styrene (8 CI); Benzene, ethenyl- (9 CI)
100-42-5
C8-H8
MW 104.14, MP -31 C, BP 145-146 C, VP 39.4 atm at 374.4 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9773 Urine	18 Inhalation	a) 4-594 ug/ml b) 0-1041 ug/ml c) 8-263 ug/ml d) 31-999 ug/ml e) 4-98 ug/ml f) 8-358 ug/ml g) 4-40 ug/ml h) 3-221 ug/ml	a) Not given b) Not given c) Not given d) Not given e) Not given f) Not given g) Not given h) Not given	a) Mandelic acid, metabolite, shop A, non-smokers b) Smokers, shop A c) Mandelic acid, shop B, non-smokers d) Smokers, shop B e) Phenylglyoxylic acid (metabolite), shop A, non-smokers f) Smokers, shop A g) Phenylglyoxylic acid, shop B, non-smokers h) Smokers, shop B After exposure to time-weighted average of 40-50 ppm Fiber-reinforced plastics boat factory workers 16-71 yr old, 1 mo-30 yr employment Exposed workers had higher incidence of sister chromatid exchanges than did non-smokers. More chromosomal aberrations in all exposed workers than in non-exposed. Inhibition of cell proliferation in exposed workers and smokers. HPLC
JAPAN; ADULTS; CHROMOSOMAL ABERRATIONS; URINE; COMPARATIVE EVALUATIONS; STYRENES; INDUSTRIAL ATMOSPHERES; METABOLITES; OCCUPATIONAL HAZARDS; SMOKING Wanatabe, T.; Endo, A.; Kumai, M.; Ikeda, M. 1983 Environmental Mutagenesis 5:299-309				

Sulfate
14808-79-8
O4-S

Tissue	Cases Exposure Route	Range	Mean	General Information
9774 Blood, serum	8 Ingestion	a) Not given b) Not given	a) 0.410+/-0.043 mM b) 0.311+/-0.043 mM c) 0.417+/-0.059 mM d) 0.513+/-0.055 mM	a) Controls, water b) 1.5 g acetominophen c) 6.0 g ascorbic acid d) 9.0 g sodium sulphate as decahydrate Steady-state 2 hr after dose. Healthy volunteers, 6 males, 2 females, 26-55 yr old (mean, 30 yr), wt 45.5-97.7 kg (mean, 75.5 kg), body surface area 1.41-2.24 sq m (mean, 1.92 sq m) Turbidometric assay
BLOOD SERUM; URINE; DELIBERATE EXPOSURE; ADULTS; BIOACCUMULATION Morris, M.E.; Levy, G. 1983 Clinical Pharmacology and Therapeutics 33(4):529-535				

Sulfate
14808-79-8
O4-S

Tissue	Cases Exposure Route	Range	Mean	General Information
9776 Urine	7 Ingestion	a) 17.6-80.4 mmol/d b) 11.8-59.7 %	a) 28.8+/-4.2 mmol/d b) 30.2+/-17.2 %	a) Baseline excretion b) % dose after 24 hr Dose 13.0 g as sulfate in 4 equal portions at 1 hr intervals. Excretion during next 48 hr negligible Healthy 28.7+/-6.3 yr old men, wt 75.8+/-6.0 kg. Upset stomach, diarrhea LC
URINE; DELIBERATE EXPOSURE; NEW YORK; ADULTS; INGESTION Morris, M.B.; Levy, G. 1988 Journal of Toxicology-Clinical Toxicology 20(2):107-114				

Tissue	Cases Exposure Route	Range	Mean	General Information
9776 Urine	8 Ingestion	a) Not given b) Not given	a) 1.55+/-0.46 mmol b) 1.02+/-0.48 mmol c) 1.60+/-0.55 mmol d) 2.36+/-0.87 mmol /1.73 sq m	a) Controls, water b) 1.5 g acetominophen c) 6.0 g ascorbic acid d) 9.0 g sodium sulphate as decahydrate Excretion for 2 hr period, 1-3 hr after dose. Healthy volunteers, 6 males, 2 females, 26-55 yr old (mean, 30 yr), wt 45.5-97.7 kg (mean, 75.3 kg), body surface area 1.41-2.24 sq m (mean, 1.92 sq m) Turbidometric assay
BLOOD SERUM; URINE; DELIBERATE EXPOSURE; ADULTS; BIOACCUMULATION Morris, M.B.; Levy, G. 1988 Clinical Pharmacology and Therapeutics 23(4):529-535				

Terbium

7440-27-9
Tb
AtW 158.9254, MP 1356 C, BP 3123 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9777 Lung	a) 1 b) 7 Inhalation	a) Not given b) Not given	a) 230 ppb b) 1.7 ppb	a) Exposed worker, biopsy b) Unexposed controls, autopsies 58 yr old photoengraver, exposed to smoke from carbon arc lamp during 46 yr. 20-83 yr old controls. Italy Worker: dyspnea, cough, cyanosis (extremities), crepitant rales, pulmonary fibrosis, hypertension, cardiac hypertrophy and overloading, death from acute cardiorespiratory insufficiency NA
9778 Lymph node	a) 1 b) 7 Inhalation	a) Not given b) Not given	a) 1.6 ppb b) 0.7 ppb	a) Exposed worker, biopsy b) Unexposed controls, autopsies 58 yr old photoengraver, exposed to smoke from carbon arc lamp during 46 yr. 20-83 yr old controls. Italy Worker: dyspnea, cough, cyanosis (extremities), crepitant rales, pulmonary fibrosis, hypertension, cardiac hypertrophy and overloading, death from acute cardiorespiratory insufficiency NA
NEODYMIUM; YTTERBIUM; TERBIUM; EUROPIUM; LUTETIUM; ITALY; ADULTS; AUTOPSIES; CASE HISTORIES; PNEUMOCONIOSIS; LUNGS; LYMPH NODES; BIOPSIES; CERIUM; LANTHANUM; METALS; SAMARIUM; THORIUM; DUST; FUMES; INHALATION; OCCUPATIONAL HAZARDS; PRINTING INDUSTRY; OCCUPATIONAL EXPOSURE Vocaturo, G.; Colombo, F.; Zanoni, M.; Rodi, F.; Sabbioni, E.; Pietra, R. 1965 Chest 65(6):760-768				

Terphenyl, chlorinated

61788-33-8
EXACT COMPOSITION UNKNOWN OR UNDETERMINED

Tissue	Cases Exposure Route	Range	Mean	General Information
9779 Adipose				Review. Occurrence of PCTs in human tissues from the Netherlands, Japan and USA. Most assays conducted in Japan. PCT levels lower than PCBs in fat, milk and fetal organs, higher in blood and liver. Very long biological half-life.
9780 Blood				Review. Occurrence of PCTs in human tissues from the Netherlands, Japan and USA. Most assays conducted in Japan. PCT levels lower than PCBs in fat, milk and fetal organs, higher in blood and liver. Very long biological half-life.
9781 Brain				Review. Occurrence of PCTs in human tissues from the Netherlands, Japan and USA. Most assays conducted in Japan. PCT levels lower than PCBs in fat, milk and fetal organs, higher in blood and liver. Very long biological half-life.
9782 Kidney				Review. Occurrence of PCTs in human tissues from the Netherlands, Japan and USA. Most assays conducted in Japan. PCT levels lower than PCBs in fat, milk and fetal organs, higher in blood and liver. Very long biological half-life.

(next page)

Terphenyl, chlorinated
61788-33-8
EXACT COMPOSITION UNKNOWN OR UNDETERMINED

(continued)

Tissue	Cases Exposure Route	Range	Mean	General Information
9783 Liver				Review. Occurrence of PCTs in human tissues from the Netherlands, Japan and USA. Most assays conducted in Japan. PCT levels lower than PCBs in fat, milk and fetal organs, higher in blood and liver. Very long biological half-life.
9784 Milk				Review. Occurrence of PCTs in human tissues from the Netherlands, Japan and USA. Most assays conducted in Japan. PCT levels lower than PCBs in fat, milk and fetal organs, higher in blood and liver. Very long biological half-life.
9785 Milk, fat				Review. Occurrence of PCTs in human tissues from the Netherlands, Japan and USA. Most assays conducted in Japan. PCT levels lower than PCBs in fat, milk and fetal organs, higher in blood and liver. Very long biological half-life.
9786 Omentum				Review. Occurrence of PCTs in human tissues from the Netherlands, Japan and USA. Most assays conducted in Japan. PCT levels lower than PCBs in fat, milk and fetal organs, higher in blood and liver. Very long biological half-life.
9787 Pancreas				Review. Occurrence of PCTs in human tissues from the Netherlands, Japan and USA. Most assays conducted in Japan. PCT levels lower than PCBs in fat, milk and fetal organs, higher in blood and liver. Very long biological half-life.
9788 Skin				Review. Occurrence of PCTs in human tissues from the Netherlands, Japan and USA. Most assays conducted in Japan. PCT levels lower than PCBs in fat, milk and fetal organs, higher in blood and liver. Very long biological half-life.

REVIEW; ADIPOSE TISSUE; OMENTUM; MILK; LIVER; KIDNEYS; BRAIN; PANCREAS; BLOOD; SKIN; CONSUMER EXPOSURE; ENVIRONMENTAL EXPOSURE; JAPAN; NETHERLANDS; UNITED STATES; CHLORINE ORGANIC COMPOUNDS; CHLORINATED HYDROCARBONS; POLYCHLORINATED TERPHENYLS; BIOACCUMULATION; FOOD CONTAMINATION; INDUSTRIAL POLLUTION; LAND POLLUTION; WATER POLLUTION

Jensen, A.A.; Jorgensen, K.F. 1983 Science of the Total Environment 27:281-360

Thallium
7440-28-0
Tl
AtW 204.37, MP 303.5 C, BP 1457 C, VP 1 mm Hg at 825 C, 10 mm Hg at 1000 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9789 Blood, serum	a) 1 b) 1 c) 1 Ingestion	a) Not applicable b) Not applicable c) Not applicable	a) 50 ug/100 ml b) 740 ug/100 ml c) 422 ug/100 ml	a) 51 yr old female b) 61 yr old female c) 80 yr old female Cardiac and pulmonary disease may dominate acute stages of illness. Patients b), c) died on days 7 and 62, respectively. Toxic Tl level, greater than 2 ug/100 ml. Admissions to hospital Some effects were gastrointestinal distress, alopecia, central nervous system dysfunction, including ataxia and coma, cardiac symptoms, and pulmonary distress. Effusions and inflammation associated with adult respiratory distress syndrome. Myocardial edema, disruption of muscular architecture, and mononuclear infiltrates. AAS
9790 Urine	a) 1 b) 1 c) 1 Ingestion	a) Not applicable b) Not applicable c) Not applicable	a) 5000 ug/L b) 2000 ug/L c) 21,600 ug/L	a) 51 yr old female b) 45 yr old male c) 80 yr old female Cardiac and pulmonary disease may dominate acute stages. Patient c) died on day 62 after admission. Toxic Tl level, greater than 10 ug/L. Admissions to hospital Some effects were gastrointestinal distress, alopecia, central nervous system dysfunction, including ataxia and coma, cardiac symptoms, and pulmonary distress. Effusions and inflammation associated with adult respiratory distress syndrome. Myocardial edema, disruption of muscular architecture, and mononuclear infiltrates. AAS

BLOOD; URINE; THALLIUM; ACCIDENTAL POISONING; CASE HISTORIES; DELIBERATE EXPOSURE

Roby, D.S.; Fein, A.M.; Bennett, R.H.; Morgan, L.S.; Zatuchni, J.; Lippmann, M.L. 1984 Chest 85(2):236-240

Tissue	Cases Exposure Route	Range	Mean	General Information
9791 Urine	a) 1265 b) 82 c) 117 d) 24 e) 74 f) 198 g) 149 Ingestion	a) <0.1-76.5 ug/l b) <0.1-35.8 ug/l c) 0.2-37.7 ug/l d) 0.4-14.8 ug/l e) <0.2-42.6 ug/l f) <0.1-58.9 ug/l g) 0.02-0.7 ug/l	a) 5.2+/-8.3 ug/l b) 2.4+/-4.3 ug/l c) 3.0+/-5.6 ug/l d) 3.4+/-3.5 ug/l e) 7.2+/-8.8 ug/l f) 3.7+/-7.00 ug/l g) 0.3+/-0.14 ug/l	a) Sept 7-10, 1979 survey b) Sept 20-Dec 31, 1979 survey c) Dec 13-20, 1979 survey d) Nov, 1979. Kindergarten, school 0.5 km from plant. e) Sept/Oct 1980. Subjects with >20 ug/l in 1979 or with possible Tl related health disorders f) Sept/Oct 1981. Subjects with >20 ug/l in 1979 or with possible Tl related health disorders g) Controls From eating contaminated fruits and vegetables General population, selected subjects exposed to cement plant dust, Lengerich, West Germany AAS

GERMANY; ADOLESCENTS; ADULTS; CHILDREN; NEWBORN; URINE; COMPARATIVE EVALUATIONS; THALLIUM; DUST; FOOD CONTAMINATION; HEALTH HAZARDS; INDUSTRIAL EMISSIONS; INDUSTRIAL PLANTS; ENVIRONMENTAL EXPOSURE; POPULATION EXPOSURE

Dolgner, R.; Brockhaus, A.; Ewers, U.; Wiegand, H.; Majewski, F.; Soddemann, H. 1983 International Archives of Occupational and Environmental Health 52:79-94

Theophylline (8 CI); 1H-Purine-2,6-dione, 3,7-dihydro-1,3-dimethyl- (9 CI)
58-55-9
C7-H8-N4-O2
MW 180.17, MP 270-274 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9792 Blood, serum	10 Ingestion	Not given	8.4+/-1.7 mg/l	2.2+/-0.8 hr after 5 mg anhydrous/kg body wt. Significant bronchodilator effect, similar to that of caffeine, maximal at 2 hr, and remaining at 6 hr. Asthmatic 8-18 yr old after 48 hr without methylxanthines LC
BLOOD SERUM; DELIBERATE EXPOSURE; RESPIRATORY DISEASES; COMPARATIVE EVALUATIONS; CAFFEINE; THEOPHYLLINES; DRUGS Becker, A.B.; Simons, K.J.; Gillespie, C.A.; Simons, F.E.R. 1984 New England Journal of Medicine 310(12):743-746				

Thiocyanic acid, ion(1-) (8 CI); Thiocyanate (9 CI)
302-04-5
C-N-S
MW 58.08

Tissue	Cases Exposure Route	Range	Mean	General Information
9793 Blood, plasma	a) 187 b) 181 Inhalation	a) 30-185 umol/l b) 5-85 umol/l	a) 109+/-47 umol/l b) 33+/-15 umol/l	a) Smokers, 22.8+/-12.5 cigarettes/d b) Non-smokers Order of sensitivity in distinguishing groups: plasma, cotinine, blood carboxyhemoglobin, thiocyanate 187 smokers in voluntary smoking-reduction campaign. 181 non-smokers matched for age and sex. CC
BLOOD PLASMA; DELIBERATE EXPOSURE; AUSTRALIA; ADULTS; COMPARATIVE EVALUATIONS; HEMOGLOBINS; THIOCYANATES; NICOTINE; BIOACCUMULATION; BIOLOGICAL MONITORING; HEALTH HAZARDS; INHALATION; METABOLITES; SMOKING; TOBACCOS Pojer, R.; Whitfield, J.B.; Poulus, V.; Eckhart, I.F.; Richmond, R.; Hensley, W.J. 1984 Clinical Chemistry 30(8):1377-1380				

Tissue	Cases Exposure Route	Range	Mean	General Information
9794 Blood, plasma	6 Inhalation	a) Not given b) Not given c) Not given	a) 24.0+/-1.4 ug/ml b) 25.0+/-0.9 ug/ml c) 27.8+/-2.1 ug/ml	a) Before smoking b) 24 min after smoking 1 cigarette c) 264 min after smoking 1 cigarette Healthy volunteers, 25-37 yr old, 3 males, 3 females, moderate (20-30 cigarettes daily) smokers Spectrophotometry
BLOOD PLASMA; URINE; DELIBERATE EXPOSURE; UNITED KINGDOM; ADULTS; STIMULANTS; HEMOGLOBINS; NICOTINE; THIOCYANATES; BIOACCUMULATION; BIOINDICATORS; HEALTH HAZARDS; INHALATION; METABOLISM; SMOKING; TOBACCOS; SALIVA; DRUGS Hopkins, R.; Wood, L.E.; Sinclair, N.M. 1984 Clinical Pharmacology and Therapeutics 36(6):788-795				

Thiocyanic acid, ion(1-) (8 CI); Thiocyanate (9 CI)
302-04-5
C-N-S
MW 58.08

Tissue	Cases Exposure Route	Range	Mean	General Information
9705 Blood, serum	163 Inhalation	a) Not given b) Not given c) Not given d) Not given e) Not given f) Not given	a) 95.0+/-7.9 umol/L b) 85.9+/-2.8 umol/L c) 32.3+/-2.2 umol/L d) 72.0+/-9.0 umol/L e) 26.0+/-2.5 umol/L f) 23.0+/-1.5 umol/L S.E.	a) 29 smokers b) 51 passive smokers c) 83 nonsmokers d) 24 smokers e) 41 passive smokers f) 71 nonsmokers Maternal serum, a)-c), cord serum, d)-f) Significant differences: a) vs b), c), $p<.0001$, d) vs e), f), $p<.001$ Women, 23-25 yr, full-term pregnancies, normal deliveries
BLOOD SERUM; ENVIRONMENTAL EXPOSURE; THIOCYANATES; AIR POLLUTION; INHALATION; PREGNANCY; TRANSPLACENTAL TRANSFER; SMOKING; DELIBERATE EXPOSURE Hauth, J.C.; Hauth, J.; Drawbaugh, R.B.; Gilstrap, L.C. III; Pierson, W.P. 1984 Obstetrics and Gynecology 63:819-822				

Tissue	Cases Exposure Route	Range	Mean	General Information
9706 Blood, serum	24 Inhalation	a) 35-175 umol/L b) 25-70 umol/L	a) 97.3+/-45.4 um/L b) 54.2+/-11.3 umol/L	a) 14 cases, families of 1 or more smokers b) 10 cases, non-smoking families Levels significantly higher in a) ($p<0.002$). 2 children <18 mo old (mothers smoke) levels of 175 and 161 umol/l. Author felt levels "useful means of estimating 'passive smoking' in children." See letter Lancet 1(8421):169, "Serum Thiocyanate In Passive Smoking" by M.J. Jarvis for contrary viewpoint 18 boys and 6 girls age 10 wk-32 yr (mean 7.6 yr) Birmingham, Alabama Colorimetry
BLOOD SERUM; ENVIRONMENTAL EXPOSURE; ALABAMA; CHILDREN; ADOLESCENTS; THIOCYANATES; SMOKING; AIR POLLUTION Poulton, J.; Rylance, G.W.; Taylor, A.W.J.; Edwards, G. 1984 Lancet 2(8416):1405-1406				

Tissue	Cases Exposure Route	Range	Mean	General Information
9707 Blood, serum	37 Ingestion	a) Not given b) Not given c) Not given d) Not given e) Not given f) Not given g) Not given h) Not given	a) 4.0+/-0.4 mg/l b) 7.8+/-0.3 mg/l c) 6.0+/-0.4 mg/l d) 7.0+/-0.3 mg/l e) 8.4+/-1.8 mg/l f) 10.7+/-1.8 mg/l g) 10.1+/-1.7 mg/l h) 8.0+/-1.3 mg/l S.E.	a) Nonsmokers, initial level, 32 subjects b) 4 wk, 32 subjects c) 8 wk, 28 subjects d) 12 wk, 32 subjects e) Smokers (1-20 cigarettes/d) initial level, 5 subjects f) 4 wk, 5 subjects g) 8 wk, 4 subjects h) 12 wk, 5 subjects 8 mg daily from milk with 20 mg/l. Significant differences: a) from b) & d) ($p<0.001$), b) from c) & d) ($p<0.05$), f) from e) ($p<0.01$). No apparent effect on thyroid function. Healthy volunteers, Uppsala, Sweden
BLOOD SERUM; URINE; DELIBERATE EXPOSURE; CONSUMER EXPOSURE; SWEDEN; ADULTS; THIOCYANATES; FOOD ADDITIVES Dahlberg, P.-A.; Bergmark, A.; Bjorck, L.; Bruce, A.; Hambraeus, L.; Claesson, O. 1984 American Journal of Clinical Nutrition 39:416-420				

Thiocyanic acid, ion(1-) (8 CI); Thiocyanate (9 CI)
302-04-5
C-N-S
MW 58.08

Tissue	Cases Exposure Route	Range	Mean	General Information
9798 Blood, serum	180 Inhalation	a) Not given b) Not given c) Not given d) Not given e) Not given f) Not given g) Not given h) Not given	a) 6.26+/-3.15 mg/l b) 6.61+/-3.66 mg/l c) 4.65+/-3.55 mg/l d) 7.36+/-3.02 mg/l e) 4.93+/-3.58 mg/l f) 7.59+/-2.75 mg/l g) 8.56+/-3.14 mg/l h) 2.64+/-1.65 mg/l	a) 19 heavy marijuana (>/= 3/wk) users b) 18 occasional marijuana (</= 1/wk) users c) 93 marijuana nonusers d) 12 menthol users e) 118 menthol nonusers f) 29 deep inhalation smokers g) 31 light inhalation smokers h) 70 non smokers Data also correlated with sex, total nicotine intake, and number of cigarettes. Healthy volunteers Colorimetry

BLOOD SERUM; CONSUMER EXPOSURE; ADULTS; THIOCYANATES; NICOTINE; DRUG ABUSE; INHALATION; BIOACCUMULATION; BIOLOGICAL MONITORING; METABOLITES; POPULATION EXPOSURE; SMOKING; TOBACCOS

Gardner, M.J.; McCarthy, T.L.; Jusko, W.J. 1984 Journal of Toxicology and Environmental Health 14:393-406

Tissue	Cases Exposure Route	Range	Mean	General Information
9799 Blood, serum	5726 Inhalation	a) 135-153 umol/l b) 135-153 umol/l c) 132-154 umol/l d) Not given	a) 145 umol/l b) 145 umol/l c) 146 umol/l d) 37 umol/l	a) Correlated with tar content of cigarette brand, 2561 subjects b) Correlated with nicotine content of cigarette brand, 2561 subjects c) Correlated with carbon monoxide content of cigarette brand, 2561 subjects d) Control non-smoking group, 3167 subjects Study found weak correlation with brand tar, nicotine, and carbon monoxide content. Adult smokers (age 25-74) in seven Midwestern communities. Control group. Colorimetry

BLOOD SERUM; CONSUMER EXPOSURE; ADULTS; COMPARATIVE EVALUATIONS; THIOCYANATES; BIOACCUMULATION; CARCINOGEN; METABOLITES; POPULATION EXPOSURE; SMOKING; TOBACCOS

Folsom, A.R.; Pechacek, T.F.; de Gaudemaris, R.; Luepker, R.V.; Jacobs, D.R.; Gillum, R.F. 1984 American Journal of Public Health 74(6):564-568

Tissue	Cases Exposure Route	Range	Mean	General Information
9800 Saliva	6 Inhalation	a) Not given b) Not given	a) 152+/-9 ug/ml b) 153+/-8 ug/ml	a) Before smoking b) 264 min after smoking 1 cigarette Healthy volunteers, 25-37 yr old, 3 males, 3 females, moderate (20-30 cigarettes daily) smokers Spectrophotometry

BLOOD PLASMA; URINE; DELIBERATE EXPOSURE; UNITED KINGDOM; ADULTS; STIMULANTS; HEMOGLOBINS; NICOTINE; THIOCYANATES; BIOACCUMULATION; BIOINDICATORS; HEALTH HAZARDS; INHALATION; METABOLISM; SMOKING; TOBACCOS; SALIVA; DRUGS

Hopkins, R.; Wood, L.E.; Sinclair, N.M. 1984 Clinical Pharmacology and Therapeutics 36(6):788-795

Thiocyanic acid, ion(1-) (8 CI); Thiocyanate (9 CI)
302-04-5
C-N-S
MW 58.08

Tissue	Cases Exposure Route	Range	Mean	General Information
9801 Saliva	a) 395 b) 868	a) Not given b) Not given	a) 2452+/-1228 umol/L b) 2094+/-1209 umol/L	a) Controls, mean of 12.8+/-11.5 cigarettes/d b) Treatment group, 6.4+/-8.7 cigarettes/d Data at 8 mo of pregnancy. Infants from mothers in b) had mean birth weight 92 g, length 0.6 cm > control group infants. 24.9 yr old pregnant women, approx 40% were black, ht 164 cm, wt before pregnancy 60 kg, gestation age 15 wk Chem
CONSUMER EXPOSURE; DELIBERATE EXPOSURE; SMOKING; PREGNANCY; FETUS; NEWBORN; GROWTH				
Sexton, M.; Hebel, J.R. 1984 Journal of the American Medical Association 251(7):911-915				

Tissue	Cases Exposure Route	Range	Mean	General Information
9802 Urine	32 Ingestion	a) Not given b) Not given c) Not given d) Not given e) Not given f) Not given	a) 16.1+/-1.0 mg b) 20.2+/-1.4 mg c) 17.6+/-1.1 mg d) 19.1+/-4.8 mg e) 20.9+/-3.0 ng f) 21.8+/-4.0 mg /g creatine S.E.	a) Nonsmokers, initial level, 27 subjects b) 4 wk c) 12 wk d) Smokers (1-20 cigarettes/d), initial level, 5 subjects e) 4 wk f) 12 wk 8 mg/d from milk with 20 mg/l. a) significantly different from b) ($p<0.05$) Healthy volunteers, Uppsala. Sweden
BLOOD SERUM; URINE; DELIBERATE EXPOSURE; CONSUMER EXPOSURE; SWEDEN; ADULTS; THIOCYANATES; FOOD ADDITIVES				
Dahlberg, P.-A.; Bergmark, A.; Bjorck, L.; Bruce, A.; Hambraeus, L.; Claesson, O. 1984 American Journal of Clinical Nutrition 39:416-420				

Thorium
7440-29-1
Th
AtW 232.0381, MP 1842 + or - 30 C (also reported as 1690 and 1750 C)

Tissue	Cases Exposure Route	Range	Mean	General Information
9803 Bone	a) 16 b) 7 Inhalation	a) Not given b) Not given	a) 0.16 pCi/kg b) 0.10 pCi/kg Median Fresh wt	a) Grand Junction, CO: 230th/232th mean (7.5), median (8.4) b) Washington, DC: 230th/232th mean (4.2), median (3.7) Significant difference ($p<0.1$) between population medians possibly due to older median age of CO subjects (67 vs 33 yr), but significant difference ($p<0.5$) in 230th/232th ratios suggests past exposure of CO residents to elevated 230th source. Long-time residents, 1.5-86 yr old, mostly accident victims. Electrodeposition; Solid-state spectrometry

(next page)

Thorium
7440-29-1
Th
AtW 232.0381, MP 1842 + or - 30 C (also reported as 1690 and 1750 C)

(continued)

Tissue	Cases Exposure Route	Range	Mean	General Information
9804 Kidney	a) 17 b) 6 Inhalation	a) Not given b) Not given	a) 0.07 pCi/kg b) 0.03 pCi/kg Median Fresh wt	a) Grand Junction, CO: 230th/232th mean (3.9), median (3.1) b) Washington, DC: 230th/232th mean (5.8), median (5.6) Significant difference ($p<0.1$) between population medians possibly due to older median age of CO subjects (67 vs 33 yr). Difference in 230th/232th ratios insignificant ($p>0.5$) suggesting no difference in past exposures. Long-time residents, 1.5-86 yr old, mostly accident victims. Electrodeposition; Solid-state spectrometry
9805 Liver	a) 16 b) 10 Inhalation	a) Not given b) Not given	a) 0.03 pCi/kg b) 0.05 pCi/kg Median Fresh wt	a) Grand Junction, CO: 230th/232th mean (4.5), median (3.6) b) Washington, DC: 230th/232th mean (3.9), median (2.7) No significant difference between population medians ($p>0.1$) or 230th/232/th ratios ($p>0.5$), suggesting no difference in past exposure. Long-time residents, 1.5-86 yr old, mostly accident victims. Electrodeposition; Solid-state spectrometry
COLORADO; DISTRICT OF COLUMBIA; AUTOPSIES; CADAVERS; BONES; KIDNEYS; LIVER; LUNGS; LYMPH NODES; SPLEEN; TESTES; THYROID GLANDS; BIOPSIES; COMPARATIVE EVALUATIONS; THORIUM; BIOACCUMULATION; DUST; INHALATION; ENVIRONMENTAL EXPOSURE Ibrahim, S.A.; Wrenn, M.E.; Singh, N.P.; Cohen, N.; Saccomano, G. 1983 Health Physics 44:213-220				

Tissue	Cases Exposure Route	Range	Mean	General Information
9806 Lung	a) 1 b) 7 Inhalation	a) Not given b) Not given	a) 175 ppb b) 7.5 ppb	a) Exposed worker, biopsy b) Unexposed controls, autopsies 58 yr old photoengraver, exposed to smoke from carbon arc lamp during 46 yr. 20-83 yr old controls. Italy Worker: dyspnea, cough, cyanosis (extremities), crepitant rales, pulmonary fibrosis, hypertension, cardiac hypertrophy and overloading, death from acute cardiorespiratory insufficiency NA
NEODYMIUM; YTTERBIUM; TERBIUM; EUROPIUM; LUTETIUM; ITALY; ADULTS; AUTOPSIES; CASE HISTORIES; PNEUMOCONIOSIS; LUNGS; LYMPH NODES; BIOPSIES; CERIUM; LANTHANUM; METALS; SAMARIUM; THORIUM; DUST; FUMES; INHALATION; OCCUPATIONAL HAZARDS; PRINTING INDUSTRY; OCCUPATIONAL EXPOSURE Vocaturo, G.; Colombo, F.; Zanoni, M.; Rodi, F.; Sabbioni, E.; Pietra, R. 1983 Chest 83(5):780-783				

Thorium
7440-29-1
Th
AtW 232.0381, MP 1842 + or - 30 C (also reported as 1690 and 1750 C)

Tissue	Cases Exposure Route	Range	Mean	General Information
9507 Lung	a) 19 b) 10 Inhalation	a) Not given b) Not given	a) 0.58 pCi/kg b) 0.52 pCi/kg Median Fresh wt	a) Grand Junction, CO: 230th/232th mean (2.1), median (1.9) b) Washington, DC: 230th/232th mean (1.4), median (1.2) Significant difference ($p<0.1$) between population medians possibly due to older median age of CO subjects (67 vs 33 yr). Difference in 230th/232th ratios insignificant ($p>0.5$) suggesting no difference in past exposures. Long-time residents, 1.5-86 yr old, mostly accident victims. Electrodeposition; Solid-state spectrometry
COLORADO; DISTRICT OF COLUMBIA; AUTOPSIES; CADAVERS; BONES; KIDNEYS; LIVER; LUNGS; LYMPH NODES; SPLEEN; TESTES; THYROID GLANDS; BIOPSIES; COMPARATIVE EVALUATIONS; THORIUM; BIOACCUMULATION; DUST; INHALATION; ENVIRONMENTAL EXPOSURE Ibrahim, S.A.; Wrenn, M.E.; Singh, N.P.; Cohen, N.; Saccomano, G. 1988 Health Physics 44:213-220				

Tissue	Cases Exposure Route	Range	Mean	General Information
9505 Lymph node	a) 1 b) 4 Inhalation	a) Not given b) Not given	a) 26.6 ppb b) 24.5 ppb	a) Exposed worker, biopsy b) Unexposed controls, autopsies 58 yr old photoengraver, exposed to smoke from carbon arc lamp during 46 yr. 20-88 yr old controls. Italy Worker: dyspnea, cough, cyanosis (extremities), crepitant rales, pulmonary fibrosis, hypertension, cardiac hypertrophy and overloading, death from acute cardiorespiratory insufficiency NA
NEODYMIUM; YTTERBIUM; TERBIUM; EUROPIUM; LUTETIUM; ITALY; ADULTS; AUTOPSIES; CASE HISTORIES; PNEUMOCONIOSIS; LUNGS; LYMPH NODES; BIOPSIES; CERIUM; LANTHANUM; METALS; SAMARIUM; THORIUM; DUST; FUMES; INHALATION; OCCUPATIONAL HAZARDS; PRINTING INDUSTRY; OCCUPATIONAL EXPOSURE Vocaturo, G.; Colombo, F.; Zanoni, M.; Rodi, F.; Sabbioni, E.; Pietra, R. 1985 Chest 88(5):780-783				

Tissue	Cases Exposure Route	Range	Mean	General Information
9509 Lymph node	a) 14 b) 10 Inhalation	a) Not given b) Not given	a) 7.8 pCi/kg b) 2.8 pCi/kg Median Fresh wt	a) Grand Junction, CO: 230th/232th mean (1.5), median (1.4) b) Washington, DC: 230th/232th mean (1.9), median (1.8) Significant difference ($p<0.1$) between population medians possibly due to older median age of CO subjects (67 vs 33 yr). Difference in 230th/232th ratios insignificant ($p>0.5$) suggesting no difference in past exposures. Long-time residents, 1.5-86 yr old, mostly accident victims. Electrodeposition; Solid-state spectrometry
9510 Spleen	14 Inhalation	Not given	0.09 pCi/kg Median Fresh wt	Grand Junction, CO. Long-time residents, 1.5-86 yr old, mostly accident victims. Electrodeposition; Solid-state spectrometry

(next page)

Thorium
7440-29-1
Th
AtW 232.0381, MP 1842 + or - 30 C (also reported as 1690 and 1750 C)

(continued)

Tissue	Cases Exposure Route	Range	Mean	General Information
9811 Testis	4 Inhalation	Not given	0.05 pCi/kg Median Fresh wt	Grand Junction, CO. Long-time residents, 1.5-86 yr old, mostly accident victims. Electrodeposition; Solid-state spectrometry
9812 Thyroid gland	1 Inhalation	Not given	0.65 pCi/kg Median Fresh wt	Grand Junction, CO. Long-time residents, 1.5-86 yr old, mostly accident victims. Electrodeposition; Solid-state spectrometry
COLORADO; DISTRICT OF COLUMBIA; AUTOPSIES; CADAVERS; BONES; KIDNEYS; LIVER; LUNGS; LYMPH NODES; SPLEEN; TESTES; THYROID GLANDS; BIOPSIES; COMPARATIVE EVALUATIONS; THORIUM; BIOACCUMULATION; DUST; INHALATION; ENVIRONMENTAL EXPOSURE Ibrahim, S.A.; Wrenn, M.E.; Singh, N.P.; Cohen, N.; Saccomanno, G. 1983 Health Physics 44:213-220				

Thorium, isotope of mass 228
14274-82-9
Th
MW 232.0381, MP approx 1750 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9813 Bone	a) 16 b) 7 Inhalation	a) Not given b) Not given	a) 0.54 pCi/kg b) 0.60 pCi/kg Median Fresh wt	a) Grand Junction, CO b) Washington, DC No significant difference ($p>0.1$) between populations. Long-time residents, 1.5-86 yr old, mostly accident victims. Electrodeposition; Solid-state alpha spectrometry
9814 Kidney	a) 17 b) 8 Inhalation	a) Not given b) Not given	a) 0.07 pCi/kg b) 0.09 pCi/kg Median Fresh wt	a) Grand Junction, CO b) Washington, DC No significant difference ($p>0.1$) between populations. Long-time residents, 1.5-86 yr old, mostly accident victims. Electrodeposition; Solid-state alpha spectrometry
9815 Liver	a) 16 b) 10 Inhalation	a) Not given b) Not given	a) 0.07 pCi/kg b) 0.09 pCi/kg Median Fresh wt	a) Grand Junction, CO b) Washington, DC No significant difference ($p>0.1$) between populations. Long-time residents, 1.5-86 yr old, mostly accident victims. Electrodeposition; Solid-state alpha spectrometry
9816 Lung	a) 19 b) 10 Inhalation	a) Not given b) Not given	a) 0.28 pCi/kg b) 0.24 pCi/kg Median Fresh wt	a) Grand Junction, CO b) Washington, DC No significant difference ($p>0.1$) between populations. Long-time residents, 1.5-86 yr old, mostly accident victims. Electrodeposition; Solid-state alpha spectrometry

(next page)

Thorium, isotope of mass 228
14274-82-9
Th
MW 232.0381, MP approx 1750 C

(continued)

Tissue	Cases Exposure Route	Range	Mean	General Information
9817 Lymph node	a) 14 b) 10 Inhalation	a) Not given b) Not given	a) 5.1 pCi/kg b) 2.6 pCi/kg Median Fresh wt	a) Grand Junction, CO b) Washington, DC Significant difference ($p<0.1$) between populations possibly due to older median age of CO subjects (67 vs 33 yr). Long-time residents, 1.5-86 yr old, mostly accident victims. Electrodeposition; Solid-state alpha spectrometry
9818 Spleen	14 Inhalation	Not given	0.06 pCi/kg Median Fresh wt	Grand Junction, CO. Long-time residents, 1.5-86 yr old, mostly accident victims. Electrodeposition; Solid-state alpha spectrometry
9819 Testis	4 Inhalation	Not given	0.02 pCi/kg Median Fresh wt	Grand Junction, CO. Long-time residents, 1.5-86 yr old, mostly accident victims. Electrodeposition; Solid-state alpha spectrometry
9820 Thyroid gland	1 Inhalation	Not given	0.33 pCi/kg Median Fresh wt	Grand Junction, CO. Long-time residents, 1.5-86 yr old, mostly accident victims. Electrodeposition; Solid-state alpha spectrometry
COLORADO; DISTRICT OF COLUMBIA; AUTOPSIES; CADAVERS; BONES; KIDNEYS; LIVER; LUNGS; LYMPH NODES; SPLEEN; TESTES; THYROID GLANDS; BIOPSIES; COMPARATIVE EVALUATIONS; THORIUM; BIOACCUMULATION; DUST; INHALATION; ENVIRONMENTAL EXPOSURE Ibrahim, S.A.; Wrenn, M.E.; Singh, N.P.; Cohen, N.; Saccomano, G. 1983 Health Physics 44:213-220				

Thorium, isotope of mass 230
14269-63-7
Th
MW 230

Tissue	Cases Exposure Route	Range	Mean	General Information
9821 Bone	a) 16 b) 7 Inhalation	a) Not given b) Not given	a) 0.92 pCi/kg b) 0.32 pCi/kg Median Fresh wt	a) Grand Junction, CO: 230th/232th mean (7.5), median (6.6) b) Washington, DC: 230th/232th mean (4.2), median (3.7) Significant difference($p<0.1$) between population medians possibly due to older median age of CO subjects (67 vs 33 yr), but significant difference ($p<0.5$) in 230th/232th ratios suggest past exposure of CO residents to elevated 230th source. Long-time residents, 1.5-86 yr old, mostly accident victims. Electrodeposition; Solid state spectrometry
9822 Kidney	a) 17 b) 8 Inhalation	a) Not given b) Not given	a) 0.29 pCi/kg b) 0.17 pCi/kg Median Fresh wt	a) Grand Junction, CO: 230th/232th mean (3.9), median (3.1) b) Washington, DC: 230th/232th mean (5.8), median (5.8) Significant difference($p<0.1$) between population medians possibly due to older median age of CO subjects (67 vs 33 yr). Difference in 230th/232th ratios insignificant ($p>0.5$) suggesting no difference in past exposures. Long-time residents, 1.5-86 yr old, mostly accident victims. Electrodeposition; Solid-state spectrometry

(next page)

Thorium, isotope of mass 230
14269-63-7
Th
MW 230

(continued)

Tissue	Cases Exposure Route	Range	Mean	General Information
9623 Liver	a) 16 b) 10 Inhalation	a) Not given b) Not given	a) 0.15 pCi/kg b) 0.15 pCi/kg Median, Fresh wt	a) Grand Junction, CO: 230th/232th mean (4.5), median (3.6) b) Washington, DC: 230th/232th mean (3.9), median (2.7) Significant difference between population medians ($p>0.1$) or 230th/232th ratios, ($p>0.5$), suggesting no difference in past exposure. Long-time residents, 1.5-86 yr old, mostly accident victims. Electrodeposition; Solid-state spectrometry
9624 Lung	a) 10 b) 10 Inhalation	a) Not given b) Not given	a) 0.84 pCi/kg b) 0.31 pCi g Median Fresh wt	a) Grand Junction, CO: 230th/232th mean (2.1), median (1.9) b) Washington, DC: 230th/232th mean (1.4), median (1.2) Significant difference ($p<0.1$) between population medians possibly due to older median age of CO subjects (67 vs 33 yr). Difference in 230th/232th ratios insignificant ($p>0.5$) suggesting no difference in past exposures. Long-time residents, 1.5-86 yr old, mostly accident victims. Electrodeposition; Solid-state spectrometry
9625 Lymph node	a) 14 b) 10 Inhalation	a) Not given b) Not given	a) 11.0 pCi/kg b) 4.6 pCi/kg Median Fresh wt	a) Grand Junction, CO: 230th/232th mean (1.5), median (1.4) b) Washington, DC: 230th/232th mean (1.9), median (1.8) Significant difference ($p<0.1$) between population medians possibly due to older median age of CO subjects (67 vs 33 yr). Difference in 230th/232th ratios insignificant ($p>0.5$) suggesting no difference in past exposures. Long-time residents, 1.5-86 yr old, mostly accident victims. Electrodeposition; Solid-state spectrometry
9626 Spleen	14 Inhalation	Not given	0.13 pCi/kg Median Fresh wt	Grand Junction, CO. Long-time residents, 1.5-86 yr old, mostly accident victims. Electrodeposition; Solid-state spectrometry
9627 Testis	4 Inhalation	Not given	0.06 pCi/kg Median Fresh wt	Grand Junction, CO. Long-time residents, 1.5-86 yr old, mostly accident victims. Electrodeposition; Solid-state spectrometry
9628 Thyroid gland	1 Inhalation	Not given	0.82 pCi/kg Median Fresh wt	Grand Junction, CO. Long-time residents, 1.5-86 yr old, mostly accident victims. Electrodeposition; Solid-state spectrometry
COLORADO; DISTRICT OF COLUMBIA; AUTOPSIES; CADAVERS; BONES; KIDNEYS; LIVER; LUNGS; LYMPH NODES; SPLEEN; TESTES; THYROID GLANDS; BIOPSIES; COMPARATIVE EVALUATIONS; THORIUM; BIOACCUMULATION; DUST; INHALATION; ENVIRONMENTAL EXPOSURE Ibrahim, S.A.; Wrenn, M.E.; Singh, N.P.; Cohen, N.; Saccomano, G. 1988 Health Physics 44:213-220				

Tin
7440-31-5
Sn
AtW 118.69, MP 231.9 C, BP 2507 C, VP 1 mm Hg at 1610 C, 10 mm Hg at 1890 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9829 Aorta	a) 8 b) 6 c) 7	a) Not applicable b) 0.45-0.73 ppm c) Not given Dry wt	a) 0.00 ppm b) Not given c) 0.74+/-0.39 ppm Dry wt	a) Sclerotic aorta from metal-workers b) Normal aorta from metal-workers c) Normal aorta from non metal-workers 45-66 yr old workers. Autopsies, Japan, 1976-1977. Employed 7-32 yr ES
AORTA; VERTEBRAE; BONES; ENVIRONMENTAL EXPOSURE; OCCUPATIONAL EXPOSURE; JAPAN; AUTOPSIES; CADAVERS; CARDIOVASCULAR DISEASES; MINERALS; BIOACCUMULATION; DIETS; FOODS; MINERAL DEPOSITS; CALCIUM; PHOSPHORUS; IRON; MAGNESIUM; ZINC; ALUMINUM; COPPER; CADMIUM; LEAD; NICKEL; VANADIUM; CHROMIUM; MANGANESE; SILICON; TIN; TITANIUM; STRONTIUM Teraoka, H. 1984 Archives of Environmental Contamination and Toxicology 13:119-127				

Tissue	Cases Exposure Route	Range	Mean	General Information
9850 Blood, plasma		a) Not given b) Not given c) Not given	a) 0.034+/-0.006 ug/mL b) 0.038+/-0.017 ug/mL c) 0.034+/-0.006 ug/mL	a) Insulin-treated diabetics b) Non-insulin-treated diabetics c) Control non-diabetics Collected after overnight fasting. Differences not significant. 18-78 yr olds, Oxford, England NA; AAS
BLOOD PLASMA; ENGLAND; DIABETES; METABOLISM; MINERAL METABOLISM; ALUMINUM; ANTIMONY; ARSENIC; BARIUM; BROMINE; CADMIUM; CALCIUM; CESIUM; CHROMIUM; COBALT; COPPER; IODINE; IRON; LEAD; MAGNESIUM; MANGANESE; MERCURY; MOLYBDENUM; NICKEL; RUBIDIUM; SCANDIUM; SELENIUM; SILVER; TIN; VANADIUM; ZINC Ward, N.I.; Pim, B. 1984 Biological Trace Element Research 6:469-487				

Tissue	Cases Exposure Route	Range	Mean	General Information
9881 Milk	a) 2 b) 3 c) 4	a) <or= 3.5-4.1 ug/kg b) <3-<3.8 ug/kg c) <2-<2.5 ug/kg Dry wt	a) Not given b) Not given c) Not given	a) Colostrum (1st or 2nd day post partum) b) Transitional milk (3-8 days post partum) c) Mature milk (1-8 mo post partum) Slovenia, Yugoslavia NA
MILK; ARSENIC; CADMIUM; COBALT; COPPER; MERCURY; IODINE; MANGANESE; ANTIMONY; SELENIUM; VANADIUM; ZINC; YUGOSLAVIA; ENVIRONMENTAL EXPOSURE Kosta, L.; Byrne, A.R.; Dermelj, M. 1983 Science of the Total Environment 29:261-268				

Titanium
7440-32-6
Ti
AtW 47.90, MP 1677 C, BP 3277 C, VP 1 mm Hg at 2180 C, 10 mm Hg at 2480 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9852 Aorta	a) 3 b) 6 c) 7	a) 2.6-4.5 ppm b) 0.68-3.0 ppm c) Not given Dry wt	a) Not given b) Not given c) 0.45+/-0.29 ppm Dry wt	a) Sclerotic aorta from metal-workers b) Normal aorta from metal-workers c) Normal aorta from non metal-workers 45-66 yr old workers. Autopsies, Japan, 1976-1977. Employed 7-32 yr ES
9853 Bone	1	Not given	<2 ppm Dry wt	Lumbar vertebrae (n=5). Chromate plating worker, employed 7 yr, died at age 66, 30 yr after changing jobs ES
AORTA; VERTEBRAE; BONES; ENVIRONMENTAL EXPOSURE; OCCUPATIONAL EXPOSURE; JAPAN; AUTOPSIES; CADAVERS; CARDIOVASCULAR DISEASES; MINERALS; BIOACCUMULATION; DIETS; FOODS; MINERAL DEPOSITS; CALCIUM; PHOSPHORUS; IRON; MAGNESIUM; ZINC; ALUMINUM; COPPER; CADMIUM; LEAD; NICKEL; VANADIUM; CHROMIUM; MANGANESE; SILICON; TIN; TITANIUM; STRONTIUM Terasoka, H. 1984 Archives of Environmental Contamination and Toxicology 13:119-127				

Toluene (8 CI); Benzene, methyl- (9 CI)
108-88-3
C7-H8
MW 92.13, MP -95 to -94.5 C, BP 110.6 C, VP 36.7 mm Hg at 30 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9834 Blood	16 Inhalation	a) Not given b) Not given	a) 1.1+/-0.4 ppm b) 0.7+/-0.4 ppm	a) At approximately 2 hr b) Post exposure Levels for combined toluene, methyl ethyl ketone, 50.5 +/- 1.1 ppm and 98.3 +/- 0.6 ppm, respectively. Exposed 4 hr to test behavioral effects 18-36 yr old healthy college students, Cincinnati, OH Small but significant impairment on one measure of a visual-vigilance task
BLOOD; BREATH; DELIBERATE EXPOSURE; OHIO; ADULTS; NEUROLOGIC MANIFESTATIONS; ALCOHOLS; TOLUENE; DRUGS Dick, R.B.; Setzer, J.V.; Wait, R.; Hayden, M.B.; Taylor, B.J.; Tolos, B.; Putz-Anderson, V. 1984 International Archives of Occupational and Environmental Health 54:91-109				

Tissue	Cases Exposure Route	Range	Mean	General Information
9835 Blood	2 Inhalation	a) 823-1122 ug/l b) 392-408 ug/l c) 181-193 ug/l d) 45-120 ug/l	a) Not applicable b) Not applicable c) Not applicable d) Not applicable	a) 36 hr after 8 hr exposure b) 72 hr c) 84 hr d) 112 hr Workers covering walls of windowless basement with pitch in solvent mixture. Workers exposed to pitch solvent fumes, Italy Coma for 14 hr GC/MS
BLOOD; BREATH; OCCUPATIONAL EXPOSURE; ENVIRONMENTAL EXPOSURE; ADULTS; TOLUENE; FUMES; INHALATION; OCCUPATIONAL HAZARDS Brugnone, F.; Perbellini, L.; Apostoli, P.; Locatelli, M.; Mariotto, P. 1983 International Archives of Occupational and Environmental Health 53:157-165				

Toluene (8 CI); Benzene, methyl- (9 CI)
108-88-3
C7-H8
MW 92.13, MP -95 to -94.5 C, BP 110.6 C, VP 36.7 mm Hg at 30 C

Tissue	Cases Exposure Route	Range	Mean	General Information
5836 Blood				Review. General information, reported levels, sources of exposure, metabolites, and methods of analysis for: phthalate ester plasticizers, chlorophenoxy acid herbicides, chlorophenol biocides, p-nitrophenol, simple phenols, benzenediols, and toluene.

URINE; ENVIRONMENTAL EXPOSURE; OCCUPATIONAL EXPOSURE; DELIBERATE EXPOSURE; CONSUMER EXPOSURE; ADULTS; REVIEW; CARCINOMAS; POISONING; MEASUREMENT METHODS; PESTICIDES; INDUSTRIAL CHEMICALS; HERBICIDES; INSECTICIDES; FUNGICIDES; PENTACHLOROPHENOL; SOLVENTS; BENZENES; PHENOLS; INDUSTRIAL POLLUTION; TOLUENE; BLOOD; CARCINOGEN; METABOLISM; METABOLITES; WOOD PRESERVATIVES
Fatiadi, A.J. 1983 Priority Toxic Pollutants in Human Urine: Their Occurrence and Analysis, Aug. 1983, 60 p

Tissue	Cases Exposure Route	Range	Mean	General Information
9837 Blood	67 Ingestion Inhalation	a) Not given b) Not given c) Not given d) Not given e) Not given	a) 10.6+/-3.5 umol/l b) 15.1+/-3.9 umol/l c) 3.1+/-2.4 umol/l d) 2.1+/-1.9 umol/l e) 1.9+/-2.0 umol/l	a) 80 ppm for 4 hr b) 80 ppm for 4 hr. 1.5 ml vodka/kg body wt ingested after 3rd hr c) 50-200 ppm. alcohol intake <1x/mo d) 50-200 ppm. Alcohol intake 1x/wk e) 50-200 ppm. Alcohol intake several d/wk Exposure chamber studies a), b), occupational exposures c)-e) Significant inverse relationship with drinking habits in occupationally exposed. Rubber-based products factory workers, mean age 41.8 yr. Volunteers, mean age 34.5 yr Alcohol inhibited toluene metabolism under experimental conditions. GC

COMPARATIVE EVALUATIONS; ALCOHOLS; ADULTS; BLOOD; TOLUENE; ALCOHOLIC BEVERAGES; HEALTH HAZARDS; INDUSTRIAL EMISSIONS; INDUSTRIAL PLANTS; METABOLISM; DRUGS; OCCUPATIONAL EXPOSURE; DELIBERATE EXPOSURE
Waldron, H.A.; Cherry, N.; Johnston, J.D. 1983 International Archives of Occupational & Environmental Health 51:365-369

Tissue	Cases Exposure Route	Range	Mean	General Information
9838 Blood	11 Inhalation Ingestion	a) 2.5-2.0 umol/l b) 3.0-1.0 umol/l	a) Not applicable b) Not applicable	a) 10 min-7.5 hr, peak (7.4 umol/l) at 2.5 hr during 4.5 hr exposure of 3.25 mmol/cu m b) Treatment with 15 mmol/kg ethanol, 10 min-7.5 hr, peak (12.5 umol/l) at 4 hr during 4.5 hr exposure of 3.25 mmol/cu m Presence of ethanol increased levels and decreased apparent clearance. Healthy volunteers GC

BLOOD; DELIBERATE EXPOSURE; ADULTS; SWEDEN; ALCOHOLS; TOLUENE; ALCOHOLIC BEVERAGES; BIOACCUMULATION; METABOLISM; OCCUPATIONAL HAZARDS
Wallen. M.; Naslund, P.H.; Nordqvist, M.B. 1984 Toxicology and Applied Pharmacology 76:414-419

Toluene (8 CI); Benzene, methyl- (9 CI)
108-88-3
C7-H8
MW 92.13, MP -95 to -94.5 C, BP 110.6 C, VP 36.7 mm Hg at 30 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9839 Breath	144 Inhalation	a) Not given b) Not given c) Not given d) Not given e) Not given f) Not given g) Not given	a) 4.8+/-1.8 ppm b) 7.0+/-2.2 ppm c) 7.6+/-1.8 ppm d) 2.4+/-0.9 ppm e) 2.2+/-1.2 ppm f) 3.0+/-1.1 ppm g) 0.7+/-0.5 ppm	a) At 1 hr, exposure to toluene only, 30 cases b) 2 hr, 32 cases c) 4 hr, 12 cases d) 1.5 hr post-exposure, 30 cases e) At 2 hr exposure toluene/MEK, 16 cases f) 4 hr, 16 cases g) 1 hr post-exposure, 16 cases Chamber levels (means): toluene alone, 100.1+/-2.5 ppm, mixture, 50.5+/-1.1 ppm toluene and 96.3+/-0.6 ppm MEK. Exposed 4 hr to test behavioral effects. No significant difference between toluene and mixture 18-38 yr old healthy college students, Cincinnati, OH Small but significant impairment on one measure of a visual-vigilance task
BLOOD; BREATH; DELIBERATE EXPOSURE; OHIO; ADULTS; NEUROLOGIC MANIFESTATIONS; ALCOHOLS; TOLUENE; DRUGS Dick, R.B.; Setzer, J.V.; Wait, R.; Hayden, M.B.; Taylor, B.J.; Tolos, B.; Putz-Anderson, V. 1984 International Archives of Occupational and Environmental Health 54:91-100				

Tissue	Cases Exposure Route	Range	Mean	General Information
9840 Breath	2 Inhalation	a) 38-53 ug/l b) 24-34 ug/l c) 13-18 ug/l d) 7-8 ug/l e) 1-3 ug/l	a) Not applicable b) Not applicable c) Not applicable d) Not applicable e) Not applicable	a) 36 hr after 8 hr exposure b) 48 hr c) 66 hr d) 90 hr e) 112 hr Workers covering walls of windowless basement with pitch in solvent mixture. Found in coma after exposure. Workers exposed to pitch solvent, Italy Coma for 14 hr GC/MS
BLOOD; BREATH; OCCUPATIONAL EXPOSURE; ENVIRONMENTAL EXPOSURE; ADULTS; TOLUENE; FUMES; INHALATION; OCCUPATIONAL HAZARDS Brugnone, F.; Perbellini, L.; Apostoli, P.; Locatelli, M.; Mariotto, P. 1983 International Archives of Occupational and Environmental Health 53:157-166				

Toluene (8 CI); Benzene, methyl- (9 CI)
108-88-3
C7-H8
MW 92.13, MP -95 to -94.5 C, BP 110.6 C, VP 36.7 mm Hg at 30 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9841 Breath	4 Inhalation	a) 23-26 ppm b) 14-17 ppm	a) Not applicable b) Not applicable	a) Exposure to 100 ppm and ethanol during work load of 100w, 0-30 min, peak (30 ppm) at 15 min b) Control, 100 ppm exposure, 0-30 min, peak (20 ppm) at 15 min Also tested cimetidine and propanolol. Healthy volunteers, 22-25 yr old Photoionization
9842 Urine	4 Inhalation Ingestion	a) 1-3 umol/min b) 21-5 umol/min c) 7-5 umol/min d) 0 umol/min e) 10-5 umol/min f) 4-4 umol/min	a) -f) Not applicable	a) Control, 0-24 hr, no peak b) Exposure 100 ppm for 7 hr, peak (32 umol/min) at 4 hr c) Exposure 100 ppm for 7 hr, and 1% blood level ethanol, peak (15 umol/min) at 13 hr d) Same as a) e) Dose as b), peak (30 umol/min) at 7 hr f) Dose as c), peak (20 umol/min) at 9 hr 0-24 hr collection, hippuric acid metabolite measured in a)-c), o-cresol metabolite in d)-f). Ethanol inhibits toluene metabolism. Also examined effects of cimetidine and propanolol. Healthy volunteers, 22-25 yr old HPLC

BLOOD PLASMA; URINE; BREATH; DELIBERATE EXPOSURE; DENMARK; ADULTS; TOLUENE; ALCOHOLIC BEVERAGES; BIOACCUMULATION; INHALATION; METABOLITES; DRUGS

Dossing, M.; Baelum, J.; Hansen, S.H.; Lundqvist, G.R. 1984 International Archives of Occupational and Environmental Health 54:309-315

Tissue	Cases Exposure Route	Range	Mean	General Information
9843 Urine				Review. General information, reported levels, sources of exposure, metabolites, and methods of analysis for: phthalate ester plasticisers, chlorophenoxy acid herbicides, chlorophenol biocides, p-nitrophenol, simple phenols, benzenediols, and toluene. Hippuric acid, o-cresol, m-cresol, p-cresol, and phenol (toluene metabolite) levels reported.

URINE; ENVIRONMENTAL EXPOSURE; OCCUPATIONAL EXPOSURE; DELIBERATE EXPOSURE; CONSUMER EXPOSURE; ADULTS; REVIEW; CARCINOMAS; POISONING; MEASUREMENT METHODS; PESTICIDES; INDUSTRIAL CHEMICALS; HERBICIDES; INSECTICIDES; FUNGICIDES; PENTACHLOROPHENOL; SOLVENTS; BENZENES; PHENOLS; INDUSTRIAL POLLUTION; TOLUENE; BLOOD; CARCINOGEN; METABOLISM; METABOLITES; WOOD PRESERVATIVES

Patiadi, A.J. 1983 Priority Toxic Pollutants in Human Urine: Their Occurrence and Analysis, Aug. 1983, 60 p

Toluene (8 CI); Benzene, methyl- (9 CI)
108-88-3
C7-H8
MW 92.13, MP -95 to -94.5 C, BP 110.6 C, VP 36.7 mm Hg at 30 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9844 Urine	130 Inhalation	a) 250-1100 ug/L b) 900-2250 ug/L c) 400-1500 ug/L d) 1300-2000 ug/L e) 200-2200 mg/L f) 3000-4400 mg/L g) 700-1400 mg/L h) 2300-2925 mg/l	a) Not given b) 1472 ug/L c) Not given d) 1377 ug/L e) Not given f) 3381 mg/L g) Not given h) 2496 mg/L	a) 25 ppm, males b) 100 ppm, males c) 25 ppm, females d) 100 ppm, males e) 25 ppm, males f) 100 ppm, males g) 25 ppm, females h) 100 ppm, females Exposure levels, ppm in air, measured by dosimeters. a)-d) o-cresol metabolite, e)-h) hippuric acid metabolite, males, 74 cases, females, 56 cases. Individual metabolism patterns varied, unrelated to dose. Exposed factory workers: printing factory, rubber boot plant, printing roll plant, rubber container plant GC
URINE; OCCUPATIONAL EXPOSURE; ADULTS; TOLUENE; INDUSTRIAL PLANTS; INHALATION; METABOLISM; METABOLITES Hasegawa, K.; Shiojima, S.; Koizumi, A.; Ikeda, M. 1983 International Archives of Occupational and Environmental Health 52:197-208				

Tissue	Cases Exposure Route	Range	Mean	General Information
9845 Urine	a) 4 b) 5 c) 6 d) 4 e) 4 f) 5 g) 6 h) 4 Inhalation	a) 0.6-2.1 mg/ml b) 1.1-2.2 mg/ml c) 1.0-2.8 mg/ml d) 1.2-7.1 mg/ml e) 0-0.11 mg f) 0.68-1.38 mg g) 0.17-0.76 mg h) 0.17-0.72 mg	a) 1.2 mg/ml b) 1.7 mg/ml c) 1.9 mg/ml d) 3.5 mg/ml e) 0.03 mg f) 1.04 mg g) 0.48 mg h) 0.33 mg	a) Hippuric acid (HA) metabolite, first sample after exposure at rest b) HA metabolite, first sample after exposure under 50W workload c) HA metabolite, first sample after exposure under rest to 150W workload d) HA metabolite, first sample after exposure under 150W to rest workload e) O-cresol metabolite, 4 hr sample after exposure at rest f) O-cresol metabolite, 4 hr sample after exposure under 50W workload g) O-cresol metabolite, 4 hr sample after exposure under rest to 150W workload h) O-cresol metabolite, 4 hr sample after exposure under 150W to rest workload 80 ppm exposure for 2 hr. No correlation between metabolite levels and exposure. Healthy volunteers Isotachophoresis; GC
URINE; DELIBERATE EXPOSURE; SWEDEN; ADULTS; TOLUENE; BIOACCUMULATION; HEALTH HAZARDS; OCCUPATIONAL HAZARDS; INDUSTRIAL ATMOSPHERES; INDUSTRIAL PLANTS; METABOLITES; INHALATION Andersson, R.; Carlsson, A.; Nordqvist, M.B.; Sollenberg, J. 1983 International Archives of Occupational and Environmental Health 53:101-108				

Tritium
10028-17-8
T2
MW 6.032, MP -254.54 C at 162 mm Hg, BP -248.12 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9846 Urine				Review. Studies of uptake, assimilation, distribution and excretion.
URINE; REVIEW; METABOLISM; RADIATION DOSES; RADIONUCLIDES; RADIOISOTOPES				
Cawley, C.N.; Cannon, L.A.; Moschella, J.J. 1984 Health Physics 47(1):102-106				

Uric acid (8 CI); 1H-Purine-2,6,8(3H)-trione, 7,9-dihydro- (9 CI)
69-93-2
C5-H4-N4-O3
MW 168.11

Tissue	Cases Exposure Route	Range	Mean	General Information
9847 Blood, serum	24 Ingestion	Not given	3.7+/-0.2 mg/dl S.E.	25% decrease ($p<0.001$) as urate 24 hr after 6 g dose of orotic acid. Level still within normal limits. Healthy 22-62 yr old, all university students and employees. HPLC
9848 Urine	20 Ingestion	Not given	919+/-46 mg S.E.	Dose 6 g orotic acid. Urate excretion increased 50% ($p<0.001$), peak at 3.5 hr, normal by 8 hr. 10 men, 10 women (healthy 22-62 yr old, all university students and employees). HPLC
BLOOD SERUM; URINE; DELIBERATE EXPOSURE; ILLINOIS; ADULTS; COMPARATIVE EVALUATIONS; CHOLESTEROLS; PHOSPHORUS; METABOLITES				
Robinson, J.L.; Dombrowski, D.B. 1988 Nutrition Research 8:407-415				

Vanadium
7440-62-2
V
AtW 50.9414, MP 1917 C, BP 3000 C, VP 1 mm Hg at 2290 C, 10 mm Hg at 2570 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9849 Aorta	a) 3 b) 6 c) 7	a) 9.0-14.0 ppm b) 1.2-2.3 ppm c) Not given Dry wt	a) Not given b) Not given c) 1.7+/-0.67 ppm Dry wt	a) Sclerotic aorta from metal-workers b) Normal aorta from metal-workers c) Normal aorta from non metal-workers 45-66 yr old workers. Autopsies, Japan, 1976-1977. Employed 7-32 yr ES
AORTA; VERTEBRAE; BONES; ENVIRONMENTAL EXPOSURE; OCCUPATIONAL EXPOSURE; JAPAN; AUTOPSIES; CADAVERS; CARDIOVASCULAR DISEASES; MINERALS; BIOACCUMULATION; DIETS; FOODS; MINERAL DEPOSITS; CALCIUM; PHOSPHORUS; IRON; MAGNESIUM; ZINC; ALUMINUM; COPPER; CADMIUM; LEAD; NICKEL; VANADIUM; CHROMIUM; MANGANESE; SILICON; TIN; TITANIUM; STRONTIUM				
Tsuchiya, H. 1984 Archives of Environmental Contamination and Toxicology 13:119-127				

Vanadium

7440-62-2

V

AtW 50.9414, MP 1917 C, BP 3000 C, VP 1 mm Hg at 2290 C, 10 mm Hg at 2570 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9650 Blood, plasma		a) Not given b) Not given c) Not given	a) 0.0106+/-0.0010 ug/mL b) 0.0114+/-0.0039 ug/mL c) 0.0095+/-0.0013	a) Insulin-treated diabetics b) Non-insulin-treated diabetics c) Control non-diabetics Collected after overnight fasting. Significant differences between a), c) and b), c). 18-78 yr olds, Oxford, England NA; AAS
BLOOD PLASMA; ENGLAND; DIABETES; METABOLISM; MINERAL METABOLISM; ALUMINUM; ANTIMONY; ARSENIC; BARIUM; BROMINE; CADMIUM; CALCIUM; CESIUM; CHROMIUM; COBALT; COPPER; IODINE; IRON; LEAD; MAGNESIUM; MANGANESE; MERCURY; MOLYBDENUM; NICKEL; RUBIDIUM; SCANDIUM; SELENIUM; SILVER; TIN; VANADIUM; ZINC Ward, N.I.; Pim, B. 1984 Biological Trace Element Research 6:469-487				

Tissue	Cases Exposure Route	Range	Mean	General Information
9651 Blood, serum	23	260-1300 ng/L	670 ng/L	Method, checked with U.S. NBS water and serum samples, considered more reliable than atomic absorption spectroscopy. Healthy subjects NA
VANADIUM; BLOOD SERUM; MEASUREMENT METHODS; TRACE ELEMENTS Simonoff, M.; Llabador, Y.; Peers, A.M.; Simonoff, G.N. 1984 Clinical Chemistry 30(10):1700-1703				

Tissue	Cases Exposure Route	Range	Mean	General Information
9652 Bone	1	Not given	19+/-3.0 ppm Dry wt	Lumbar vertebrae (n=5). Chromate plating worker, employed 7 yr, died at age 66, 30 yr after changing jobs ES
AORTA; VERTEBRAE; BONES; ENVIRONMENTAL EXPOSURE; OCCUPATIONAL EXPOSURE; JAPAN; AUTOPSIES; CADAVERS; CARDIOVASCULAR DISEASES; MINERALS; BIOACCUMULATION; DIETS; FOODS; MINERAL DEPOSITS; CALCIUM; PHOSPHORUS; IRON; MAGNESIUM; ZINC; ALUMINUM; COPPER; CADMIUM; LEAD; NICKEL; VANADIUM; CHROMIUM; MANGANESE; SILICON; TIN; TITANIUM; STRONTIUM Terada, H. 1984 Archives of Environmental Contamination and Toxicology 13:119-127				

Vanadium

7440-62-2
V
AtW 50.9414, MP 1917 C, BP 3000 C, VP 1 mm Hg at 2290 C, 10 mm Hg at 2570 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9853 Breast	22	a) Not given b) Not given	a) 0.78+/-0.46 ug/g b) 1.34+/-0.76 ug/g	a) Normal tissue b) Neoplastic Dry wt, 8 samples, p=0.004 Patients with primary breast carcinomas, samples of normal and neoplastic tissue obtained at time of mastectomy X-ray fluorescence
BREAST; CALCIUM; VANADIUM; CHROMIUM; MANGANESE; IRON; NICKEL; COPPER; ZINC; ARSENIC; SELENIUM; BROMINE; RUBIDIUM; STRONTIUM; MOLYBDENUM; LEAD; MERCURY; NEOPLASMS Rizk, S.L.; Sky-Peck, H.H. 1984 Cancer Research 44:5390-5394				

Tissue	Cases Exposure Route	Range	Mean	General Information
9854 Hair	a) 16 b) 16	a) 0.1-2 ppm b) 0.06-0.95 ppm	a) 0.72 ppm b) 0.24 ppm	a) Pottery workers b) Controls Pottery workers from Tlaquepaque and Tonala, Mexico. Controls from Tucson, AZ NA
HAIR; OCCUPATIONAL EXPOSURE; ARIZONA; MEXICO; ADULTS; LEAD; CADMIUM; ARSENIC; VANADIUM; GOLD; ZINC; COPPER; IRON; MANGANESE; POTASSIUM Weber, C.W.; Nelson, G.W.; deVaquera, M.V.; Pearson, P.B. 1986 Nutrition Reports International 30(5):1009-1018				

Tissue	Cases Exposure Route	Range	Mean	General Information
9855 Milk	a) 12 b) 3 c) 4	a) <1.0-0.9 ug/kg b) <or= 0.6-3.2 ug/kg c) <or= 0.5-1.1 ug/kg Dry wt	a) <1.0 ug/kg b) Not given c) Not given Dry wt	a) Colostrum (1st or 2nd day post partum) b) Transitional milk (3-8 days post partum) c) Mature milk (1-8 mo post partum) Slovenia, Yugoslavia NA
MILK; ARSENIC; CADMIUM; COBALT; COPPER; MERCURY; IODINE; MANGANESE; ANTIMONY; SELENIUM; VANADIUM; ZINC; YUGOSLAVIA; ENVIRONMENTAL EXPOSURE Kosta, L.; Byrne, A.R.; Dermelj, M. 1983 Science of the Total Environment 29:261-268				

Vincaleukoblastine
865-21-4
C46-H58-N4-O9
MW 811.08, MP 211-216 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9856 Urine	1 Injection	a) 0-15% b) 0-16%	a) Not applicable b) Not applicable	a) Bolus dose, 7.5 mg/sq m IV, 0-24 hr b) 3 mo later, 1 mg/sq m continuous 24 hr infusion, 0-96 hr Cumulative % recovery. Estimated from graph. Representative case from 13 subjects. Patient with advanced breast cancer HPLC
BLOOD PLASMA; URINE; DELIBERATE EXPOSURE; NEOPLASMS; ANTITUMOR AGENTS; DRUGS; DRUG THERAPY; CHEMOTHERAPY; BIOLOGICAL MONITORING Lu, K.; Yap, H.; Loo, T.L. 1983 Cancer Research 43:1405-1408				

Vitamin A
11103-57-4
EXACT COMPOSITION UNKNOWN OR UNDETERMINED

Tissue	Cases Exposure Route	Range	Mean	General Information
9857 Liver	Ingestion	14-434 ug/g	Not given	Biopsy samples. Relative dose response values measured 4-6 d after surgery, were highest (28 and 15%) for the two lowest liver levels. 40 d after 50 mg retinyl acetate given to these two subjects, RDR values fell to 5 and 3 %. Other Vitamin A parameters normal in all subjects and unrelated to liver reserves. 22-27 yr old surgical patients, generally well-nourished, Iowa HPLC
LIVER; CONSUMER EXPOSURE; IOWA; BIOPSIES; VITAMIN A; METABOLISM Amedee-Manesme, O.; Anderson, D.; Olsen, J.A. 1984 American Journal of Clinical Nutrition 39:898-902				

Vitamin D, sulfate
11048-47-9
EXACT COMPOSITION UNKNOWN OR UNDETERMINED

Tissue	Cases Exposure Route	Range	Mean	General Information
9858 Milk				Review of levels of vitamin D and metabolites measured in human breast milk by various methods.
MILK; VITAMIN D; METABOLITES; REVIEW; MEASUREMENT METHODS; LACTATION; NUTRITIONAL DEFICIENCIES; DIETS; DRUGS Makin, H.L.J.; Seamark, D.A.; Trafford, D.J.H. 1983 Archives of Disease in Childhood 58(9):750-753				

White spirit (No postings in CHEMLINE).

Tissue	Cases Exposure Route	Range	Mean	General Information
9859 Adipose	a) 7 b) 4 Inhalation	a) 4-63 mg/kg b) <0-3 mg/kg	a) 9-41.1 mg/kg b) 0-1 mg/kg	a) 6-168 hr (Mon afternoon-Mon morning) after exposure to 100 ppm 6 hr/d for 5 d (Mon-Fri), in subcutaneous tissue. Peak 102 hr b) 6-168 hr in controls Accumulation Mon-Fri. 28% eliminated during weekend. Inverse correlation between levels and percentage body fat. In vitro samples analyzed for measurement comparisons. Levels for brain also postulated. Some values estimated from figures. Volunteers, Denmark GC/MS
9860 Blood	7 Inhalation	a) 1.86-2.37 mg/l b) 2.08-2.85 mg/l c) Not given	a) 2 mg/l b) 2.54 mg/l c) 0.3 mg/l	a) After 6 hr exposure to 100 ppm, in venous blood b) Day 5 of exposure to 100 ppm 6 hr/d c) 66 hr after end of exposure Mean morning level (before beginning of each exposure) correlated with serum triglyceride level. Volunteers, Denmark
ADIPOSE TISSUE; BLOOD; BRAIN; DELIBERATE EXPOSURE; DENMARK; BIOPSIES; IN VITRO ANALYSIS; IN VIVO ANALYSIS; HEALTH HAZARDS; INHALATION Pedersen, L.M.; Larsen, K.; Cohr, K.-H. 1984 Acta Pharmacologica et Toxicologica 55:308-316				

Tissue	Cases Exposure Route	Range	Mean	General Information
9861 Blood	12 Inhalation	1.5+/-0.4-7.2+/-1.8 mg/l	Not given	Range of means in venous blood after 6 hr exposure, during rest, to 50 and 200 ppm white spirit (52% paraffins and 48% naphthenes). Changes in serum and urine biochemistry also reported for these exposures, as well as blood levels for 100 ppm for three chemically different white spirits. Healthy volunteers, mean age 28+/-2 yr, wt 73+/-8 kg, ht 183+/-7 cm, Denmark S-alpha-amylase and S-urate decreased, but these changes were smaller than individual variations.
BLOOD; DELIBERATE EXPOSURE; DENMARK; SOLVENTS; HEALTH HAZARDS; INHALATION; METABOLISM Pedersen, L.M.; Cohr, K.-H. 1984 Acta Pharmacologica et Toxicologica 55:317-324				

Ytterbium

7440-64-4
Yb
AtW 173.04, MP 824 C (also reported as 819 C), BP 1194 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9862 Lung	a) 1 b) 9 Inhalation	a) Not given b) Not given	a) 252 ppb b) 3.5 ppb	a) Exposed worker, biopsy b) Unexposed controls, autopsies 58 yr old photoengraver, exposed to smoke from carbon arc lamp during 46 yr. 20-63 yr old controls. Italy Worker: dyspnea, cough, cyanosis (extremities), crepitant rales, pulmonary fibrosis, hypertension, cardiac hypertrophy and overloading, death from acute cardiorespiratory insufficiency NA

(next page)

Ytterbium

7440-64-4
Yb
AtW 173.04, MP 824 C (also reported as 819 C), BP 1194 C

(continued)

Tissue	Cases Exposure Route	Range	Mean	General Information
9662 Lymph node	a) 1 b) 2 Inhalation	a) Not given b) Not given	a) 3.1 ppb b) 0.7 ppb	a) Exposed worker, biopsy b) Unexposed controls, autopsies 58 yr old photoengraver, exposed to smoke from carbon arc lamp during 46 yr. 20-83 yr old controls. Italy Worker: dyspnea, cough, cyanosis (extremities), crepitant rales, pulmonary fibrosis, hypertension, cardiac hypertrophy and overloading, death from acute cardiorespiratory insufficiency NA
NEODYMIUM; YTTERBIUM; TERBIUM; EUROPIUM; LUTETIUM; ITALY; ADULTS; AUTOPSIES; CASE HISTORIES; PNEUMOCONIOSIS; LUNGS; LYMPH NODES; BIOPSIES; CERIUM; LANTHANUM; METALS; SAMARIUM; THORIUM; DUST; FUMES; INHALATION; OCCUPATIONAL HAZARDS; PRINTING INDUSTRY; OCCUPATIONAL EXPOSURE Vecsture, G.; Colombo, F.; Zanoni, M.; Rodi, F.; Sabbioni, E.; Pietra, R. 1985 Chest 83(5):780-785				

Zeolites

1318-02-1
Na2-O-Al2-O3.(Si-O2)x.(H2-O)y

Tissue	Cases Exposure Route	Range	Mean	General Information
9664 Sputum	a) 19 b) 15 c) 19 d) 15 Inhalation	a) 0-103 b) 0-85 c) 0-1 d) 0-1 Ferruginous bodies/sample	a) 8.16 b) 10.07 c) 0.05 d) 0.07 Ferruginous bodies/sample	a) Karain, high occurrence of mesothelioma b) Tuskoy, high occurrence of mesothelioma c) Karlik, neighboring village d) Kizilkoy, neighboring village Counts increased with subjects' ages. Age 20 and over; Inhabitants of 4 agricultural villages, central Turkey, Karain and Tuskoy built on soft volcanic tuff releasing zeolite fibers Microscopy
ENVIRONMENTAL EXPOSURE; NEOPLASMS; PULMONARY DISEASES; CARCINOGEN; AIR POLLUTION; MINERAL DEPOSITS; TURKEY; SPUTUM; FIBERS; COMPARATIVE EVALUATIONS Sebastien, P.; Bignon, J.; Barris, Y.I.; Awad, L.; Petit, G. 1984 Archives of Environmental Health 39(1):18-23				

Zinc
7440-66-6
Zn
AtW 65.38, MP 419.5 C, BP 908 C, VP 1 mm Hg at 487 C, 10 mm Hg at 590 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9865 Amniotic fluid	128	a) 0.5-2.4 umol/l b) 0.5-4.0 umol/l c) 0.5-3.8 umol/l d) 0.4-2.7 umol/l	a) 1.2 umol/l b) 1.3 umol/l c) 1.1 umol/l d) 0.9 umol/l, ($p<0.01$)	a) Sampled at 15th wk of pregnancy, female fetus b) Same, male fetus c) Sampled at 36+/-2 wk of pregnancy, female fetus d) Sampled at 35+/-3 wk of pregnancy, male fetus. Pregnant women, 30+/-5-38+/-5 yr old, mean duration of pregnancy at birth 37+/-2-39+/-2 wks AAS
AMNIOTIC FLUID; FINLAND; FETUS; ZINC; PREGNANCY Laitinen, R.; Slimes, A.S.I.; Vuori, E.; Salmela, S.S. 1984 Biological Trace Element Research 6:415-421				

Tissue	Cases Exposure Route	Range	Mean	General Information
9866 Aorta	a) 3 b) 6 c) 7	a) 220-380 ppm Dry wt b) 68-370 ppm Dry wt c) Not given	a) Not given b) Not given c) 83+/-12 ppm Dry wt	a) Sclerotic aorta from metal-workers b) Normal aorta from metal-workers c) Normal aorta from non metal-workers 45-66 yr old workers. Autopsies, Japan, 1976-1977. Employed 7-32 yr ES
AORTA; VERTEBRAE; BONES; ENVIRONMENTAL EXPOSURE; OCCUPATIONAL EXPOSURE; JAPAN; AUTOPSIES; CADAVERS; CARDIOVASCULAR DISEASES; MINERALS; BIOACCUMULATION; DIETS; FOODS; MINERAL DEPOSITS; CALCIUM; PHOSPHORUS; IRON; MAGNESIUM; ZINC; ALUMINUM; COPPER; CADMIUM; LEAD; NICKEL; VANADIUM; CHROMIUM; MANGANESE; SILICON; TIN; TITANIUM; STRONTIUM Teraoka, H. 1984 Archives of Environmental Contamination and Toxicology 13:119-127				

Tissue	Cases Exposure Route	Range	Mean	General Information
9867 Blood	281	a) 0.9-12.7 ppm b) 1.2-15.6 ppm	a) 6.4+/-1.7 ppm b) 8.3+/-2.5 ppm	a) Maternal, 106 cases b) Cord, 97 cases Significant positive correlation. Determinations over 5-yr period. Nagoya, Japan, 1976-1978. Maternal venous and umbilical cord blood, normal deliveries. AAS
ZINC; MERCURY; METHYLMERCURY; LEAD; CADMIUM; MANGANESE; COPPER; IRON; JAPAN; BLOOD; PLACENTA; UMBILICAL CORD; METALS; ENVIRONMENTAL EXPOSURE Tsuchiya, H.; Mitani, K.; Kodama, K.; Nakata, T. 1984 Archives of Environmental Health 39(1):11-17				

Zinc
7440-66-6
Zn
AtW 65.38, MP 419.5 C, BP 908 C, VP 1 mm Hg at 487 C, 10 mm Hg at 590 C

Tissue	Cases Exposure Route	Range	Mean	General Information
5868 Blood	a) 24 b) 50 Ingestion	a) 54-122 umol/l b) 78-123 umol/l	a) 90+/-14.1 umol/l b) 96+/-10.2 umol/l	a) Elderly b) Younger controls Intake, elderly men, 138 umol/day (range 86-210), women, 136 umol/day (range 46-194). Intake 60% of recommended 229 umol/day. Overall retention 1.0 umol/day-not significantly different from equilibrium. No apparent health effects from deficiency Healthy elderly (11 men, 73.3-85.2 yr (mean 78.2), 13 women 69.7-85.5 yr (mean 75.8)) and younger controls, Southampton, England AAS
BLOOD; BLOOD PLASMA; LEUKOCYTES; URINE; DELIBERATE EXPOSURE; UNITED KINGDOM; ADULTS; COPPER; ZINC; METALS Bunker, V.W.; Hinks, L.J.; Lawson, M.S.; Clayton, B.E. 1984 American Journal of Clinical Nutrition 40:1096-1102				

Tissue	Cases Exposure Route	Range	Mean	General Information
9869 Blood		a) Not given b) Not given	a) 4.4 ug/ml 4.9 ug/ml	a) Bangladesh b) India Low values. Overall range from several countries 6-9 ug/ml. Levels from database containing data on "normal" levels of 15 elements in 7 tissues/fluids. Data selected by 60 investigators in over 40 countries. Diet, environment both important in distribution of elements.
ZINC; COPPER; MANGANESE; SELENIUM; LEAD; CADMIUM; BLOOD; BLOOD SERUM; HAIR; MILK; BANGLADESH; INDIA; TURKEY; FINLAND; ITALY; NEW ZEALAND; GUATEMALA; CHILE; SWEDEN; HUNGARY; YUGOSLAVIA; POLAND; KENYA; EGYPT; SOUTH AFRICA; UNITED STATES; AUSTRALIA; GREECE; PAKISTAN; NIGERIA; PHILIPPINES; ZAIRE; THAILAND; CHINA; WYOMING; OHIO; CALIFORNIA; JAPAN; MEXICO; CANADA; ISRAEL; PERU; SPAIN; COMPARATIVE EVALUATIONS; BIOLOGICAL MONITORING; IRAN; DIETS; ENVIRONMENTAL EXPOSURE Iyengar, G.V. 1984 Science of the Total Environment 38:125-131				

Tissue	Cases Exposure Route	Range	Mean	General Information
9870 Blood, cells		5.4-15.1 ug /g packed cells	9.56+/-1.66 ug /g packed cells	Data also given according to race, menarche, and age. 12, 14, 16 yr old healthy females, Oklahoma and Viginia AAS
ERYTHROCYTES; OKLAHOMA; VIRGINIA; ADOLESCENTS; ZINC; DIETS; DELIBERATE EXPOSURE Kenney, M.A.; Ritchey, S.J.; Culley, P.; Sandoval, W.; Moak, S.; Schilling, P. 1984 American Journal of Clinical Nutrition 39:446-451				

Zinc

7440-66-6
Zn
AtW 65.38, MP 419.5 C, BP 906 C, VP 1 mm Hg at 487 C, 10 mm Hg at 590 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9671 Blood, cells	a) 24 b) 50 Ingestion	a) 78-168 pmol b) 75-207 pmol /10(E+6) cells	a) 120+/-24.5 pmol b) 108+/-28.6 pmol /10(E+6) cells	a) Elderly b) Younger controls Intake, elderly men, 138 umol/day (range 86-210), women, 136 umol/day (range 46-194). Intake 60% of recommended 229 umol/day. Overall retention 1.0 umol/day-not significantly different from equilibrium. No apparent health effects from deficiency Healthy elderly (11 men, 73.3-85.2 yr (mean 78.2), 13 women 69.7-85.5 yr (mean 75.8)) and younger controls, Southampton, England AAS
BLOOD; BLOOD PLASMA; LEUKOCYTES; URINE; DELIBERATE EXPOSURE; UNITED KINGDOM; ADULTS; COPPER; ZINC; METALS Bunker, V.W.; Hinks, L.J.; Lawson, M.S.; Clayton, B.E. 1984 American Journal of Clinical Nutrition 40:1096-1102				

Tissue	Cases Exposure Route	Range	Mean	General Information
9672 Blood, cells	6 Ingestion	a) 9.9-12.2 ug/g b) 9.2-13.2 ug/g	a) 11.1+/-0.7 ug/g b) 11.3+/-1.2 ug/g	a) After 1 wk on diet with 15.7 mg Zn/d b) End of depletion period (4-9 wk when plasma Zn <70 ug/100 g) on diet with 0.28 mg Zn/d Healthy volunteers, CA AAS
BLOOD; BLOOD PLASMA; ERYTHROCYTES; URINE; SALIVA; HAIR; SEMEN; DELIBERATE EXPOSURE; CALIFORNIA; ADULTS; NUTRITIONAL DEFICIENCIES; ZINC; DIETS Baer, M.T.; King, J.C. 1984 American Journal of Clinical Nutrition 39:556-570				

Tissue	Cases Exposure Route	Range	Mean	General Information
9673 Blood, cells	10 Injection	8.5-8.0 ug/dl	Not applicable	0-24 hr, peak (9.0 ug/dl) at 5 hr, after 1 hr IV infusion of 20 mg EDTA/kg in 5% glucose. Range of means. Gun metal founders employed at factory 7-15 yr. Mean age 51 yr. AAS
URINE; BLOOD PLASMA; OCCUPATIONAL EXPOSURE; JAPAN; ADULTS; METAL POISONING; LEAD POISONING; COPPER; LEAD; ZINC; METALS; BIOACCUMULATION; INDUSTRIAL POLLUTION; BIOCONCENTRATION Aono, H.; Araki, S. 1984 International Archives of Occupational and Environmental Health 55:13-18				

Zinc
7440-66-6
Zn
AtW 65.38, MP 419.5 C, BP 908 C, VP 1 mm Hg at 487 C, 10 mm Hg at 590 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9874 Blood, cells	a) 22 b) 21 c) 20 d) 23 e) 21 f) 19 g) 10 h) 9 i) 5 j) 12 k) 9 l) 11	a) Not given b) Not given c) Not given d) Not given e) Not given f) Not given g) Not given h) Not given i) Not given j) Not given k) Not given l) Not given	a) 13.2+/-0.3 ug/g b) 13.6+/-0.3 ug/g c) 3.5+/-0.2 ug/g d) 12.9+/-0.2 ug/g e) 12.0+/-0.2 ug/g f) 11.1+/-0.3 ug/g g) 13.4+/-0.4 ug/g h) 14.0+/-0.7 ug/g i) 4.2+/-0.9 ug/g j) 13.3+/-0.5 k) 12.6+/-0.8 ug/g l) 10.7+/-0.4 ug/g	a) Lactating, 37th wk gestation b) Lactating, at delivery c) Lactating, at delivery, cord d) Lactating, 1 mo postpartum e) Lactating, 2 mo postpartum f) Lactating, 3 mo postpartum g) Nonlactating, 37th wk gestation h) Nonlactating, at delivery i) Nonlactating, at delivery, cord j) Nonlactating , 1 mo postpartum k) Nonlactating, 2 mo postpartum l) Nonlactating, 3 mo postpartum Measured in erythrocytes. Mean dietary Zn 42% of RDA. 30+/-2 yr olds, Maryland
MARYLAND; ADULTS; BLOOD PLASMA; ERYTHROCYTES; MILK; COMPARATIVE EVALUATIONS; DIETS; ZINC; LACTATION Moser, P.B.; Reynolds, R.D. 1983 American Journal of Clinical Nutrition 38:101-108				

Tissue	Cases Exposure Route	Range	Mean	General Information
9875 Blood, cells	7	a) 560-905 ug/dl b) 610-950 ug/dl c) 620-980 ug/dl d) 675-1000 ug/dl e) 675-1000 ug/dl f) 600-930 ug/dl	a) 795 ug/dl b) 845 ug/dl c) 855 ug/dl d) 890 ug/dl e) 900 ug/dl f) 820 ug/dl	a) 0 hr b) 0.5 hr c) 1.5 hr d) 3 hr e) 5 hr f) 24 hr After start of 20 mg/kg CaEDTA IV infusion over 1 hr. Estimated from graph. Adults with blood Pb 46-67 ug/100 g, 46-59 yr, employed at gun metal foundry 6-14 yr AAS
BLOOD; BLOOD PLASMA; ERYTHROCYTES; URINE; OCCUPATIONAL EXPOSURE; ADULTS; LEAD; ZINC Araki, S.; Aono, H.; Fukahori, M.; Tabuki, K. 1984 Archives of Environmental Health 39(5):363-367				

Zinc
7440-66-6
Zn
AtW 65.38, MP 419.5 C, BP 908 C, VP 1 mm Hg at 487 C, 10 mm Hg at 590 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9876 Blood, plasma	4 Ingestion	a) 81.2-116.8 ug/dl b) 125.8-152.8 ug/dl c) 166.0-238.1 ug/dl d) 108.4-225.9 ug/dl	a) 101.9+/-16.1 ug/dl b) 141.7+/-11.5 ug/dl c) 201.8+/-29.9 ug/dl d) 159.5+/-48.8 ug/dl	a) Prior to supplemented meal b) 2 hr c) 4 hr d) 6 hr After low Zn meal, no increase in levels. Supplemental meal containing 250 mg Zn as oxide consumed after 12 hr fast resulted in the above levels. RDA is 15 mg/d. 19-23 yr old Caucasians, 67-71 kg body wt, good general health, no history of hepatitis, smoking or taking Zn supplements AAS

BLOOD PLASMA; DELIBERATE EXPOSURE; ZINC; DIETS; MINERAL METABOLISM; BIOAVAILABILITY
Shier, N.W.; Kinney, D.R.; Hickson, J.F.; Harrington, P.J. 1984 Nutrition Reports International 30(3):637-642

Tissue	Cases Exposure Route	Range	Mean	General Information
9877 Blood, plasma	a) 10 b) 14 c) 6	a) 6.0-15.6 umol/l b) 5.6-12.2 umol/l 9.8-14.6 umol/l	a) 10.6+/-1.26 umol/l b) 9.0+/-1.21 umol/l c) 11.5+/-1.17 umol/l	a) Gastric carcinoma patients b) Patients with non-malignant intestinal disease c) Patients with malignant disease other than gastric carcinoma Significant difference between a) and b) 46 males and females, ages 58.5-68.8 yr. Required surgical resection. AAS

BLOOD PLASMA; INTESTINES; UNITED KINGDOM; CARCINOMAS; GASTROINTESTINAL DISEASES; COMPARATIVE EVALUATIONS; ZINC; MEASUREMENT METHODS
Elmes, M.E.; Clarkson, J.P.; Jones, J.G. 1984 Science of the Total Environment 34:49-56

Tissue	Cases Exposure Route	Range	Mean	General Information
9878 Blood, plasma	a) 24 b) 50 Ingestion	a) 8.0-13.4 umol/l b) 7.7-16.7 umol/l	a) 11.0+/-1.2 umol/l b) 13.0+/-1.8 umol/l	a) Elderly b) Younger controls Intake, elderly men, 138 umol/day (range 86-210), women, 136 umol/day (range 46-194). Intake 60% of recommended 229 umol/day. Overall retention 1.0 umol/day-not significantly different from equilibrium. No apparent health effects from deficiency Healthy elderly (11 men, 78.3-85.2 yr (mean 78.2), 13 women 69.7-85.5 yr (mean 75.8)) and younger controls, Southampton, England AAS

BLOOD; BLOOD PLASMA; LEUKOCYTES; URINE; DELIBERATE EXPOSURE; UNITED KINGDOM; ADULTS; COPPER; ZINC; METALS
Bunker, V.W.; Hinks, L.J.; Lawson, M.S.; Clayton, B.E. 1984 American Journal of Clinical Nutrition 40:1096-1102

Zinc
7440-66-6
Zn
AtW 65.38, MP 419.5 C, BP 908 C, VP 1 mm Hg at 487 C, 10 mm Hg at 590 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9879 Blood, plasma	26 Ingestion	a) Not given b) Not given c) Not given d) Not given e) Not given f) Not given g) Not given h) Not given	a) 91 ug/100 ml b) 100 ug/100 ml c) 110 ug/100 ml d) 93 ug/100 ml e) 116 ug/100 ml f) 98 ug/100 ml g) 122 ug/100 ml h) 100 ug/100 ml S.E.	a) Before Zn supplement b) Control, before placebos c) Zn supplement, 2 wk ($p<0.01$) d) Controls, 2 wk e) Zn supplement, 4 wk ($p<0.05$) f) Controls, 4 wk g) Zn supplement, 6 wk, ($p<0.05$) h) Controls, 6 wk Zn gluconate, 25 mg, morning and evening for 6 wk. Controls, same regemin, placebos. Study was of effects on Cu availability, based on enzymatic activity. Healthy workers, Canada AAS

ZINC; COPPER; BLOOD PLASMA; CANADA; DELIBERATE EXPOSURE
Fischer, P.W.F.; Giroux, A.; L'Abbe, M.R.L., 1984 American Journal of Clinical Nutrition 40: 743-746

Tissue	Cases Exposure Route	Range	Mean	General Information
9880 Blood, plasma	6 Ingestion	a) 60-96 ug b) 71-110 ug c) 24-67 ug /100g	a) 81+/-12 ug b) 89+/-17 ug c) 50+/-20 ug /100g	a) Prior to study b) After 1 wk on diet with 15.7 mg Zn/d c) End of depletion period (4-9 wk when plasma Zn <70 ug/100 g) on diet with 0.28 mg Zn/d Significant difference b), c) ($p<0.005$). Data available on levels during 2 wk repletions with various doses. Healthy volunteers, CA AAS

BLOOD; BLOOD PLASMA; ERYTHROCYTES; URINE; SALIVA; HAIR; SEMEN; DELIBERATE EXPOSURE; CALIFORNIA; ADULTS; NUTRITIONAL DEFICIENCIES; ZINC; DIETS
Baer, M.T.; King, J.C. 1984 American Journal of Clinical Nutrition 39:556-570

Tissue	Cases Exposure Route	Range	Mean	General Information
9881 Blood, plasma	10 Injection	90-80 ug/dl	Not applicable	0-24 hr, peak (90 ug/dl) at 1 hr, low (50 ug/dl) at 5 hr, after 1 hr IV infusion of 20 mg EDTA/kg in 5% glucose. Range of means. Gun metal founders employed at factory 7-15 yr. Mean age 51 yr. AAS

URINE; BLOOD PLASMA; OCCUPATIONAL EXPOSURE; JAPAN; ADULTS; METAL POISONING; LEAD POISONING; COPPER; LEAD; ZINC; METALS; BIOACCUMULATION; INDUSTRIAL POLLUTION; BIOCONCENTRATION
Aono, H.; Araki, S. 1984 International Archives of Occupational and Environmental Health 55:13-18

Zinc
7440-66-6
Zn
AtW 65.38, MP 419.5 C, BP 908 C, VP 1 mm Hg at 487 C, 10 mm Hg at 590 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9882 Blood, plasma	1	Not applicable	1005+/-258 ug/dl	Measured on admission (Normal level 85+/-10 ug/dl). 18 yr old Pakistani with pyoderma gangrenosum
BLOOD PLASMA; BLOOD; URINE; HAIR; LEUKOCYTES; ITALY; ADULTS; SKIN DISEASES; ZINC; BIOACCUMULATION; BIOLOGICAL MONITORING; MINERAL METABOLISM Hambidge, K.M.; Norris, D.A.; Githens, J.H.; Ambruso, D.; Catalanotto, F.A. 1984 Journal of Pediatrics 106(3):450-451				

Tissue	Cases Exposure Route	Range	Mean	General Information
9883 Blood, plasma	a) 28 b) 28 c) 28 d) 28 e) 21 f) 19 g) 13 h) 13 i) 13 j) 13 k) 13 l) 13	a) Not given b) Not given c) Not given d) Not given e) Not given f) Not given g) Not given h) Not given i) Not given j) Not given k) Not given l) Not given	a) 68.8+/-2.0 ug b) 54.8+/-2.0 ug c) 80.0+/-2.4 ug d) 79.1+/-1.7 ug e) 87.6+/-22 ug f) 84.4+/-2.4 ug g) 60.8+/-2.0 ug h) 57.9+/-4.5 ug i) 86.2+/-4.6 ug j) 83.8+/-3.0 ug k) 84.9+/-3.7 ug /100 ml	a) Lactating, 37th wk gestation b) Lactating, at delivery c) Lactating, at delivery, cord d) Lactating, 1 mo postpartum e) Lactating, 2 mo postpartum f) Lactating, 3 mo postpartum g) Nonlactating, 37th wk gestation h) Nonlactating, at delivery i) Nonlactating, at delivery, cord j) Nonlactating , 1 mo postpartum k) Nonlactating, 2 mo postpartum l) Nonlactating, 3 mo postpartum Mean dietary Zn 42% of RDA. 30 +or- 2 yr olds, Maryland AAS
MARYLAND; ADULTS; BLOOD PLASMA; ERYTHROCYTES; MILK; COMPARATIVE EVALUATIONS; DIETS; ZINC; LACTATION Moser, P.B.; Reynolds, R.D. 1983 American Journal of Clinical Nutrition 38:101-108				

Tissue	Cases Exposure Route	Range	Mean	General Information
9884 Blood, plasma	7	a) 66-100 ug/dl b) 65-80 ug/dl c) 65-85 ug/dl d) 51-60.5 ug/dl e) 39.5-55.5 ug/dl f) 64-88 ug/dl	a) 87 ug/dl b) 70.5 ug/dl c) 70.5 ug/dl d) 60.5 ug/dl e) 47 ug/dl f) 76 ug/dl	a) 0 hr b) 0.5 hr c) 1.5 hr d) 3 hr e) 5 hr f) 24 hr After start of 20 mg/kg CaEDTA IV infusion over 1 hr. Estimated from graph. Adults with blood Pb 46-67 ug/100 g, 46-59 yr, employed at gun metal foundry 6-14 yr AAS
BLOOD; BLOOD PLASMA; ERYTHROCYTES; URINE; OCCUPATIONAL EXPOSURE; ADULTS; LEAD; ZINC Araki, S.; Aono, H.; Fukahori, M.; Tabuki, K. 1984 Archives of Environmental Health 39(5):363-367				

Zinc
7440-66-6
Zn
AtW 65.38, MP 419.5 C, BP 908 C, VP 1 mm Hg at 487 C, 10 mm Hg at 590 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9885 Blood, plasma	29 Ingestion	a) Not given b) Not given c) Not given d) Not given	a) 47.9+/-12.4 ug/dl b) 42.9+/-9.5 ug/dl c) 50.2+/-16.6 ug/dl d) 45.6+/-18.2 ug/dl	a) Vegetarians, 36.5+/-2.0 wk gestation, 12 cases b) Nonvegetarians, 37.5+/-2.0 wk gestation, 16 cases c) Vegetarians, 11+/-9 wk postpartum, 7 cases d) Nonvegetarians, 10+/-7 wk postpartum, 13 cases No significant differences between dietary groups. Healthy volunteers, 19 Caucasians, 9 Mexican-Americans, 1 Oriental, 23-36 yr old AAS
BLOOD PLASMA; ENVIRONMENTAL EXPOSURE; ADULTS; NUTRITIONAL DISORDERS; COPPER; ZINC; BIOACCUMULATION; DIETS; FOODS; MEAT; PREGNANCY; VEGETABLES Abu-Assal, M.J.; Craig, W.J. 1984 Nutritional Reports International 29(2):485-493				

Tissue	Cases Exposure Route	Range	Mean	General Information
9886 Blood, plasma		a) Not given b) Not given c) Not given	a) 1.01+/-0.0020 ug/mL b) 1.15+/-0.038 ug/mL c) 1.13+/-0.09 ug/mL	a) Insulin-treated diabetics b) Non-insulin-treated diabetics c) Control non-diabetics Collected after overnight fasting. Significant differences between a), c) and a), b). 18-76 yr olds, Oxford, England NA; AAS
BLOOD PLASMA; ENGLAND; DIABETES; METABOLISM; MINERAL METABOLISM; ALUMINUM; ANTIMONY; ARSENIC; BARIUM; BROMINE; CADMIUM; CALCIUM; CESIUM; CHROMIUM; COBALT; COPPER; IODINE; IRON; LEAD; MAGNESIUM; MANGANESE; MERCURY; MOLYBDENUM; NICKEL; RUBIDIUM; SCANDIUM; SELENIUM; SILVER; TIN; VANADIUM; ZINC Ward, N.I.; Pim, B. 1984 Biological Trace Element Research 6:469-487				

Tissue	Cases Exposure Route	Range	Mean	General Information
9887 Blood, serum	6 Ingestion	108+/-8-114+/-7 ug/dl	Not given	Range of means over 75 days with Zn intake of 16.5 mg/d for 12 d, then 5.5 mg Zn/d for 54 d, then 16.5 mg Zn/d for 9 d. Serum alkaline phosphatase fell 22% by day 54 suggesting inadequate dietary Zn and rose after increased Zn intake. Although not statistically significant, this rise in SAP may be more effective in diagnosing deficiency than is serum level 4 Caucasians, 1 Hispanic, 1 Black, healthy 21-33 yr olds, mean ht 175 cm, mean wt 65.6 kg, normal pre-study serum Zn levels AAS
BLOOD SERUM; DELIBERATE EXPOSURE; NUTRITIONAL DEFICIENCIES; COMPARATIVE EVALUATIONS; ZINC; BIOINDICATORS; DIETS Herman, Z.; Wada, L.L.; King, J.C. 1984 Nutrition Reports International 29(5):1253-1259				

Zinc
7440-66-6
Zn
AtW 65.38, MP 419.5 C, BP 908 C, VP 1 mm Hg at 487 C, 10 mm Hg at 590 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9888 Blood, serum		0.51-0.58 ug/ml	Not given	Values, considered low, from Turkey. Overall range from several countries 0.8-1.1 ug/ml. Levels from database containing data on "normal" levels of 15 elements in 7 tissues/fluids. Data selected by 60 investigators in over 40 countries. Diet, environment both important in distribution of elements.

ZINC; COPPER; MANGANESE; SELENIUM; LEAD; CADMIUM; BLOOD; BLOOD SERUM; HAIR; MILK; BANGLADESH; INDIA; TURKEY; FINLAND; ITALY; NEW ZEALAND; GUATEMALA; CHILE; SWEDEN; HUNGARY; YUGOSLAVIA; POLAND; KENYA; EGYPT; SOUTH AFRICA; UNITED STATES; AUSTRALIA; GREECE; PAKISTAN; NIGERIA; PHILIPPINES; ZAIRE; THAILAND; CHINA; WYOMING; OHIO; CALIFORNIA; JAPAN; MEXICO; CANADA; ISRAEL; PERU; SPAIN; COMPARATIVE EVALUATIONS; BIOLOGICAL MONITORING; IRAN; DIETS; ENVIRONMENTAL EXPOSURE

Iyengar, G.V. 1984 Science of the Total Environment 38:125-131

Tissue	Cases Exposure Route	Range	Mean	General Information
9889 Blood, serum	105	0.5-1.2 ug/mL	0.97+/-0.15 ug/ml	Technique developed for simultaneous determination of several elements. Also measured detection limits for other elements. x-ray fluores

MEASUREMENT METHODS; BLOOD SERUM; IRON;COPPER; ZINC; BROMINE; TRACE ELEMENTS

Rastegar, F.; Maier, E.A.; Heimburger, R.; Christophe, C.; Ruch, C.; Leroy, M.J. 1984 Clinical Chemistry 30(8):1300-1303

Tissue	Cases Exposure Route	Range	Mean	General Information
6590 Blood, serum	9 Ingestion	a) 90-125 ug/dL b) Not given c) 109+/-8-113+/-5 ug/dL d) Not given	a) 99+/-3 ug/dL b) 108+/-3 ug/dL c) Not applicable d) 112+/-4 ug/dL S.E.	a) Day 1 b) Uncured c) Cured, 40 mg/kg nitrite d) Cured, 47 mg/kg nitrite + 200 mg/kg erythorbate 200 g/day cured or uncured sausage. 3 subjects/group, each set rotating to next group every 17 d. Sampled day 10 and 15 and data pooled. Healthy, 21-27 yr old. Mean ht 180 cm, mean wt 78 kg AAS

BIOAVAILABILITY; IRON; ZINC; COPPER; DELIBERATE EXPOSURE; METABOLISM; URINE; BLOOD SERUM; UNITED STATES

Greger, J.L.; Lee, K.; Graham, K.L.; Chinn, B.L.; Liebert, J.C. 1984 Journal of Agricultural and Food Chemistry 32:861-865

Zinc
7440-66-6
Zn
AtW 65.38, MP 419.5 C, BP 908 C, VP 1 mm Hg at 487 C, 10 mm Hg at 590 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9891 Blood, serum	188	a) Not given b) Not given c) 1110+/-63-1350+/-46 ug/L d) Not given e) Not given f) Not given S.E.	a) 1107+/-49 ug/L b) 847+/-32 ug/L c) Not given d) 0.9 ug/L e) 1.0 ug/L f) 0.9 ug/L S.E.	a) 80 controls b) 66 patients with myocardial infarctions c) 102 others, range of means d) Patients in b) 21-30 hr after last chest pains e) Same patients, 31-50 hr f) Same patients, 72 hr Significant differences between a) and b), d)-f) vs initial levels. d)-f) estimated from graph Controls from 30-56 yr olds, 24% with family history of ischemia. 58 yr olds with infarctions, 48 males, 8 females, 64% smokers, 32% family history of ischemia. Others - different diseases, hypertension Colorimetry
BLOOD SERUM; HEART DISEASES; HYPERTENSION; TRACE ELEMENTS; COPPER; ZINC; IRON; NICKEL; COBALT; SODIUM; POTASSIUM; CALCIUM; MAGNESIUM; PAKISTAN; COMPARATIVE EVALUATIONS; CHOLESTEROLS				
Khan, S.N.; Rahman, M.A.; Samad, A. 1984 Clinical Chemistry 30(5):644-648				

Tissue	Cases Exposure Route	Range	Mean	General Information
9892 Blood, serum	a) 81 b) 19 c) 21 d) 20	a) 0.84+/-0.16-0.93+/-0.12 b) 0.63+/-0.14-0.72+/-0.16 c) 0.64+/-0.12-0.85+/-0.17 d) 0.65+/-0.09-0.79+/-0.20 mg/l	a) Not given b) Not given c) Not given d) Not given	a) Controls, non-exposed b) Patients with Itai-itai disease - renal damage and bone lesions c) Patients suspected of having disease - renal damage, no obvious bone lesions d) Exposed - no bone or renal disorders, range of means a-d) environmentally exposed. 50-70 yr old women AAS
URINE; BLOOD SERUM; ENVIRONMENTAL EXPOSURE; JAPAN; COPPER; CADMIUM; ZINC; KIDNEY DISEASES				
Nogawa, K.; Yamada, Y.; Honda, R.; Tsuritani, I.; Kobayashi, E.; Ishizaki, M. 1984 Environmental Research 33:29-38				

Tissue	Cases Exposure Route	Range	Mean	General Information
9893 Blood, serum	9	a) Not given b) Not given c) Not given	a) 81+/-4 ug/dL b) 88+/-4 ug/dL c) 75+/-4 ug/dL	a) Immediately before 6 mi run b) Immediately after run c) 2 hr after run Significant difference a), c) ($p<0.05$). Fasted from 10 hr before to 2 hr after run. Also measured cholesterol, triglycerides, bilirubin, albumin, protein, uric acid, urea, phosphate, and alkaline phosphatase. 23-46 yr old male runners AAS
BLOOD SERUM; URINE; CALCIUM; CHROMIUM; COPPER; POTASSIUM; SODIUM; ZINC; TRACE ELEMENTS; ADULTS				
Anderson, R.A.; Polansky, M.M.; Bryden, N.A. 1984 Biological Trace Element Research 6:327-336				

Zinc
7440-66-6
Zn
AtW 65.38, MP 419.5 C, BP 908 C, VP 1 mm Hg at 487 C, 10 mm Hg at 590 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9894 Blood, serum	88	a) Not given b) Not given c) Not given d) Not given e) Not given f) Not given g) Not given h) Not given i) Not given j) Not given k) Not given l) Not given m) Not given	a) 79.7+/-13.78 ug b) 78.0+/-11.08 ug c) 63.5+/-8.72 ug d) 56.6+/-10.61 ug e) 63.0+/-12.89 ug f) 64.7+/-11.9 ug g) 97.2+/-25.91 ug h) 51.2+/-6.62 ug i) 65.9+/-12.74 ug j) 67.8+/-4.37 ug k) 79.2+/-11.24 ug l) 60.3+/-11.06 ug m) 64.6+/-13.29 ug /dl	a) 17 controls b) 46 patients, 6-14 wk c) 15-28 wk d) 29-35 wk e) >/= 36 wk f) 20 mothers at delivery g) 20 babies, umbilical cord h) 4 vegetarians, 36-42 wk i) 29 non-vegetarians, 36-42 wk j) 5 with preeclampsia, 6-14 wk k) 5 non-preclampsia 6-14 wk l) 5 with preeclampsia, 36-42 wk m) 26 non preeclampsia 36-42 wk wk gestation. Significant differences: a) from c), d) & e). b) from c), d) and e). c) from d). d) from e). h) from i). j) from k). $p<0.05$. 18-43 yr old (mean 28.7) well-nourished, middle income patients (Gravidity 1-11, mean 2.6 and Parity 0-6, mean 0.8) and their newborns. 19-43 yr old (mean 28.4) nonpregnant controls, CT AAS
BLOOD SERUM; CONNECTICUT; ADULTS; NEWBORN; ZINC; PREGNANCY Zimmerman, A.W.; Dunham, B.S.; Nochimson, D.J.; Kaplan, B.M.; Clive, J.M.; Kunkel, S.L. 1984 American Journal of Obstetrics and Gynecology 149(5):523-529				

Tissue	Cases Exposure Route	Range	Mean	General Information
9895 Blood, whole	6 Ingestion	a) 501-650 ug b) 455-612 ug /100g	a) 592+/-54 ug b) 551+/-56 ug	a) After 1 wk on diet with 15.7 mg Zn/d b) End of depletion period (4-9 wk when plasma Zn <70 ug/100g) on diet with 0.26 mg Zn/d Significant difference, $p<0.01$. Significant correlation ($r=0.8$, $p<0.0005$) with plasma levels Healthy volunteers, CA AAS
BLOOD; BLOOD PLASMA; ERYTHROCYTES; URINE; SALIVA; HAIR; SEMEN; DELIBERATE EXPOSURE; CALIFORNIA; ADULTS; NUTRITIONAL DEFICIENCIES; ZINC; DIETS Baer, M.T.; King, J.C. 1984 American Journal of Clinical Nutrition 39:556-570				

Zinc
7440-66-6
Zn
AtW 65.38, MP 419.5 C, BP 906 C, VP 1 mm Hg at 487 C, 10 mm Hg at 590 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9896 Blood, whole	a) 55 b) 54 c) 136 d) 104 e) 155 f) 128 g) 150 h) 164	a) 3.03-6.58 mg/l b) 3.12-6.20 mg/l c) 2.96-5.95 mg/l d) 3.10-5.96 mg/l e) 2.10-6.54 mg/l f) 2.72-5.96 mg/l g) 2.46-5.70 mg/l h) 2.45-5.72 mg/l	a) 4.31 mg/l b) 4.20 mg/l c) 4.57 mg/l d) 4.44 mg/l e) 4.55 mg/l f) 4.33 mg/l g) 4.16 mg/l h) 4.03 mg/l Medians	a) 2-3 yr old males b) 2-3 yr old females c) 4-5 yr old males d) 4-5 yr old females e) 9 yr old males f) 9 yr old females g) 12 yr old males h) 12 yr old females Levels independent of age and sex. Lower than average of 7.0 mg/l. Cd levels below detection limit 0.50 ng/ml. 2-12 yr olds, Kamloops, British, Columbia AAS
BLOOD; CHILDREN; COPPER; LEAD; ZINC; SEX; AGE; COMPARATIVE EVALUATIONS Subramanian, K.S.; Meranger, J.C. 1983 Science of the Total Environment 30:231-244				

Tissue	Cases Exposure Route	Range	Mean	General Information
9897 Blood, whole	72 Inhalation	a) 2.2-18.8 ug b) 2.2-27.8 ug c) 3.1-18.0 ug d) 3.0-19.2 ug e) 3.7-14.5 ug f) 2.2-18.2 ug g) 2.1-10.5 ug h) 0.8-9.8 ug /g Hb	a) 8.7+/-4.4 ug b) 10.9+/-5.7 ug c) 8.6+/-4.0 ug d) 9.8+/-4.2 ug e) 10.2+/-3.1 ug f) 9.4+/-3.2 ug g) 6.9+/-3.0 ug h) 6.4+/-2.9 ug /g Hb	a) Controls, 0 wks, 27 cases b) Controls, 16 wks, 27 cases c) Vitamin C treatment, 0 wks, 25 cases d) Vitamin C treatment, 16 wks, 25 cases e) Controls, 0 wks, 10 cases f) Controls, 8 wks, 10 cases g) Zinc treatment, 0 wks, 10 cases h) Zn treatment, 8 wks, 10 cases Vitamin C dose was 1 g/d, 5 d/wk. Zinc as Zn glutamate dose was 60 mg/d, 5 d/wk. No significant difference between control and treatment groups. 21-64 yr old workers at primary Pb smelter, 0.5-42 years exposure AAS
BLOOD; URINE; OCCUPATIONAL EXPOSURE; ADULTS; LEAD POISONING; METAL POISONING; INDUSTRIAL MEDICINE; CADMIUM; LEAD; MERCURY; ZINC; BIOACCUMULATION; HEALTH HAZARDS; INDUSTRIAL ATMOSPHERES; INDUSTRIAL PLANTS; INHALATION; OCCUPATIONAL HAZARDS; VITAMINS; VITAMIN C Lauwerys, R.; Roels, H.; Buchet, J.-P.; Bernard, A.A.; Verhoeven, L.; Konings, J. 1983 Journal of Occupational Medicine 25(8): 668-678				

Zinc
7440-66-6
Zn
AtW 65.38, MP 419.5 C, BP 908 C, VP 1 mm Hg at 487 C, 10 mm Hg at 500 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9898 Blood, whole	7	a) 290-475 ug/dl b) 290-445 ug/dl c) 240-740 ug/dl d) 290-490 ug/dl e) 270-480 ug/dl f) 292-545 ug/dl	a) 355 ug/dl b) 350 ug/dl c) 380 ug/dl d) 365 ug/dl e) 370 ug/dl f) 400 ug/dl	a) 0 hr b) 0.5 hr c) 1.5 hr d) 3 hr e) 5 hr f) 24 hr After start of 20 mg/kg CaEDTA IV infusion over 1 hr. Estimated from graph. Adults with blood Pb 46-67 ug/100 g, 46-59 yr, employed at gun metal foundry 6-14 yr AAS
BLOOD; BLOOD PLASMA; ERYTHROCYTES; URINE; OCCUPATIONAL EXPOSURE; ADULTS; LEAD; ZINC Araki, S.; Aono, H.; Fukahori, M.; Tabuki, K. 1984 Archives of Environmental Health 39(5):362-367				

Tissue	Cases Exposure Route	Range	Mean	General Information
9899 Bone	1	Not given	200+/-56 ppm Dry wt	Lumbar vertebrae (n=5). Chromate plating worker, employed 7 yr, died at age 66, 30 yr after changing jobs ES
AORTA; VERTEBRAE; BONES; ENVIRONMENTAL EXPOSURE; OCCUPATIONAL EXPOSURE; JAPAN; AUTOPSIES; CADAVERS; CARDIOVASCULAR DISEASES; MINERALS; BIOACCUMULATION; DIETS; FOODS; MINERAL DEPOSITS; CALCIUM; PHOSPHORUS; IRON; MAGNESIUM; ZINC; ALUMINUM; COPPER; CADMIUM; LEAD; NICKEL; VANADIUM; CHROMIUM; MANGANESE; SILICON; TIN; TITANIUM; STRONTIUM Teraoka, H. 1984 Archives of Environmental Contamination and Toxicology 13:119-127				

Tissue	Cases Exposure Route	Range	Mean	General Information
9000 Brain		a) Not applicable b) Not given	a) 13X10(E-5) b) 8.75+/-0.35X10(E-5) g/g dr wt	a) Samples from caudate nucleus of endogeneous psychosis patients b) Normals Tissue samples dissected 20-24 hr after death. 70 yrs old NA
BRAIN; AUTOPSIES; CASE HISTORIES; BEHAVIOR DISORDERS; COBALT; IRON; RUBIDIUM; ALCOHOLIC BEVERAGES; SELENIUM; ZINC Demmel, U.; Hock, A.; Peimendegeu, L.E.; Sebek, P. 1984 Science of the Total Environment 38:69-77				

Zinc

7440-66-6

Zn

AtW 65.38, MP 419.5 C, BP 908 C, VP 1 mm Hg at 487 C, 10 mm Hg at 590 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9001 Breast	22	a) Not given b) Not given	a) 25.6+/-12.1 ug/g b) 48.1+/-26.9 ug/g	a) Normal tissue b) Neoplastic Dry wt, 3 samples, p=0.0001 Patients with primary breast carcinoma, samples of normal and neoplastic tissue obtained at time of mastectomy X-ray fluorescence

BREAST; CALCIUM; VANADIUM; CHROMIUM; MANGANESE; IRON; NICKEL; COPPER; ZINC; ARSENIC; SELENIUM; BROMINE; RUBIDIUM; STRONTIUM; MOLYBDENUM; LEAD; MERCURY; NEOPLASMS

Rizk, S.L.; Shy-Peck, H.H. 1984 Cancer Research 44:5390-5394

Tissue	Cases Exposure Route	Range	Mean	General Information
9002 Breast fluid	Ingestion	a) Not given b) Not given c) Not given d) Not given	a) 6.7+/-4.2 ug/g b) 4.3+/-2.4 ug/g c) 2.8+/-1.0 ug/g d) 1.3+/-0.4 ug/g	a) Middle income, 3-5 days post partum, 6 cases b) Low income, 3-5 days post partum, 9 cases c) Middle income, 4-6 wks post partum, 8 cases d) Low income, 4-6 wks post partum, 8 cases Difference between c) and d) significant, ($p < 0.01$). Low income intake level, 25% RDA for lactating mothers. May result in Zn deficient newborns. Mothers in Hyderabad, India NA

MILK; INDIA; ADULTS; COPPER; MANGANESE; MOLYBDENUM; ZINC; DIETS; LACTATION; NEWBORN; NUTRITIONAL DEFICIENCIES

Dang, H.S.; Jaiswal, D.D.; Somasundaram, S.; Deshpande, A.; Dacosta, H. 1984 Science of the Total Environment 35: 85-89

Tissue	Cases Exposure Route	Range	Mean	General Information
9008 Hair	a) 179 b) 24	a) 8-494 ppm b) 118-284 ppm	a) 212 ppm b) 190 ppm	a) Pottery workers b) Controls Pottery workers from Tlaquepaque and Tonala, Mexico. Controls from Tucson, AZ AAS

HAIR; OCCUPATIONAL EXPOSURE; ARIZONA; MEXICO; ADULTS; LEAD; CADMIUM; ARSENIC; VANADIUM; GOLD; ZINC; COPPER; IRON; MANGANESE; POTASSIUM

Weber, C.W.; Nelson, G.W.; deVaquera, M.V.; Pearson, P.B. 1984 Nutrition Reports International 30(5):1009-1018

Zinc
7440-66-6
Zn
AtW 65.38, MP 419.5 C, BP 906 C, VP 1 mm Hg at 487 C, 10 mm Hg at 590 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9904 Hair		Not given	320 ug/g	Poland. Considered high level. Kenya, Egypt, Turkey, South Africa (Bantus), India, Bangladesh and part of US are marginal, 100-140 ug/g. Levels from database containing data on "normal" levels of 15 elements in 7 tissues/fluids. Data selected by 60 investigators in over 40 countries. Diet, environment both important in distribution of elements.
ZINC; COPPER; MANGANESE; SELENIUM; LEAD; CADMIUM; BLOOD; BLOOD SERUM; HAIR; MILK; BANGLADESH; INDIA; TURKEY; FINLAND; ITALY; NEW ZEALAND; GUATEMALA; CHILE; SWEDEN; HUNGARY; YUGOSLAVIA; POLAND; KENYA; EGYPT; SOUTH AFRICA; UNITED STATES; AUSTRALIA; GREECE; PAKISTAN; NIGERIA; PHILIPPINES; ZAIRE; THAILAND; CHINA; WYOMING; OHIO; CALIFORNIA; JAPAN; MEXICO; CANADA; ISRAEL; PERU; SPAIN; COMPARATIVE EVALUATIONS; BIOLOGICAL MONITORING; IRAN; DIETS; ENVIRONMENTAL EXPOSURE Iyengar, G.V. 1984 Science of the Total Environment 38:125-131				

Tissue	Cases Exposure Route	Range	Mean	General Information
9905 Hair	6 Ingestion	a) 81-222 ug/g b) 117-161 ug/g	a) 163+/-54 ug/g b) 134+/-24 ug/g	a) After 1 wk on diet with 15.7 mg Zn/d b) End of depletion period (4-9 wk when plasma Zn <70 ug/100 g) on diet with 0.26 mg Zn/d Healthy volunteers, CA ES
BLOOD; BLOOD PLASMA; ERYTHROCYTES; URINE; SALIVA; HAIR; SEMEN; DELIBERATE EXPOSURE; CALIFORNIA; ADULTS; NUTRITIONAL DEFICIENCIES; ZINC; DIETS Baer, M.T.; King, J.C. 1984 American Journal of Clinical Nutrition 39:556-570				

Tissue	Cases Exposure Route	Range	Mean	General Information
9906 Hair	34	a) Not given b) Not given c) Not given d) Not given e) Not given f) Not given	a) 704+/-105 ppm b) 251+/-48 ppm c) 137+/-22 d) 291+/-56 e) 0.52+/-0.20 f) 0.195+/-0.78	a) Hypertensives b) Controls c) Hypertensives, Zn:Cd ratio d) Control Zn:Cd ratio e) Hypertensives, Cu:Zn ratio f) Control, Cu:Zn ratio All differences statistically significant. 20 adult black females classified as hypertensive, 14 adult black normotensive females AAS
HAIR; ENVIRONMENTAL EXPOSURE; MISSISSIPPI; ADULTS; HYPERTENSION; CARDIOVASCULAR DISEASES; LEAD POISONING; METAL POISONING; BIOPSIES; CADMIUM; COPPER; LEAD; ZINC; METALS; BIOACCUMULATION; BIOLOGICAL MONITORING Medeiros, D.M.; Pellum, L.K. 1984 Bulletin of Environmental Contamination and Toxicology 32:526-532				

Zinc
7440-66-6
Zn
AtW 65.38, MP 419.5 C, BP 908 C, VP 1 mm Hg at 487 C, 10 mm Hg at 590 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9907 Hair	1	Not applicable	148 ug/gm	Measured on admission (Normal level 168+/-37 ug/gm). 18 yr old Pakistani with pyoderma gangrenosum

BLOOD PLASMA; BLOOD; URINE; HAIR; LEUKOCYTES; ITALY; ADULTS; SKIN DISEASES; ZINC; BIOACCUMULATION; BIOLOGICAL MONITORING; MINERAL METABOLISM

Hambidge, K.M.; Norris, D.A.; Githens, J.H.; Ambruso, D.; Catalanotto, F.A. 1984 Journal of Pediatrics 106(3):450-451

Tissue	Cases Exposure Route	Range	Mean	General Information
9908 Hair	a) 50 b) 56 c) 26 d) 21	a) 50-1500 mg/kg b) 71-540 mg/kg c) 89-380 mg/kg d) 46-440 mg/kg	a) 182.25 mg/kg b) 190.50 mg/kg c) 201.67 mg/kg d) 192.50 mg/kg	a) Caucasian boys b) Caucasian girls c) Hindustani children d) Creal, Chinese, and Javanese subjects, migrated from Surinam 5 g scalp hair from occipital region. 8 yr old school children living in Amsterdam suburb NA; AAS

HAIR; ENVIRONMENTAL EXPOSURE; NETHERLANDS; CHILDREN; SEX; BIOACCUMULATION; BIOLOGICAL MONITORING; DIETS; COPPER; ZINC; LEAD; IRON; CADMIUM; SELENIUM; COBALT; SILVER; GOLD

Herber, R.F.M.; Wibowo, A.A.E.; Das, H.A.; Egger, R.J.; van Deyck, W.; Zielhuis, R.L. 1983 International Archives of Occupational and Environmental Health 53:127-137

Tissue	Cases Exposure Route	Range	Mean	General Information
9909 Hair	a) 4 b) 6 c) 5 d) 11 e) 10	a) 243-673 ppm b) 133-3619 ppm c) 250-933 ppm d) 230-4200 ppm e) 56-1110 ppm	a) 543 ppm b) 1001 ppm c) 678 ppm d) 1347 ppm e) 526 ppm	a) 1-15 yr olds, rural b) 15-25 yr olds, rural c) 25 yr olds, rural d) 15-25 yr olds, different areas of country e) All age groups, different areas of country 15-25 yr olds had highest levels of trace elements. Residents of Sri Lanka AAS

HAIR; ENVIRONMENTAL EXPOSURE; SRI LANKA; CHILDREN; ADULTS; LEAD POISONING; METAL POISONING; CALCIUM; MAGNESIUM; IRON; MANGANESE; COPPER; ZINC; LEAD; AUTOMOTIVE; AIR POLLUTION; BIOACCUMULATION; HEALTH HAZARDS; LAND POLLUTION; POPULATION EXPOSURE; RURAL AREAS; URBAN AREAS; AGE

Dissanayake, C.B.; Senaratne, A.; Weerasooriya, S.V.R. 1984 Journal of Environmental Studies 23:41-48

Zinc
7440-66-6
Zn
AtW 65.38, MP 419.5 C, BP 908 C, VP 1 mm Hg at 487 C, 10 mm Hg a. 590 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9910 Hair	a) 69 b) 51 c) 5 d) 13	a) Not given b) Not given c) Not given d) Not given	a) 360+/-1.8 ug/g b) 386+/-1.7 ug/g c) 230+/-1.9 ug/g d) 326+/-2.1 ug/g Geometric means	a) Total, unwashed hair samples b) Hair pieces c) Needle-pads d) Others (undefined) In unwashed samples, no significant difference between sample types or between dates of cutting (1880-1969). After washing (non-ionic SAA), levels significantly higher in samples from 1911-1920 than from 1930-1985. Japanese women. 1981-1985 samples from 32 workers at National Institute of Environmental Studies Atomic emission spectrometry; AAS

HAIR; ENVIRONMENTAL EXPOSURE; JAPAN; COMPARATIVE EVALUATIONS; CALCIUM; COPPER; IRON; LEAD; MAGNESIUM; MANGANESE; MERCURY; MERCURY ORGANIC COMPOUNDS; METALS; MINERALS; PHOSPHORUS; POTASSIUM; SODIUM; STRONTIUM; TRACE ELEMENTS; ZINC; OCCUPATIONAL EXPOSURE
Suzuki, T.; Honge, T.; Morita, M.; Yamamoto, R. 1984 Science of the Total Environment 39:81-91

Tissue	Cases Exposure Route	Range	Mean	General Information
9911 Hair	a) 51 b) 52	a) 30-170 ug/g b) 40-210 ug/g 25th-75th percentiles	a) 82 ug/g b) 140 ug/g Medians	a) Drank hard tapwater (mean hardness 330 ppm) at least 1 yr b) Drank soft tapwater (mean hardness 33 ppm) Significant difference ($p<0.0001$). Mean daily intakes of energy, protein, Zn, Cu, Mn, and dietary fiber similar. Range estimated from graph Healthy Caucasian preschool children matched by age (4.5-5.5 yr old), sex, and socioeconomic status, Guelph, Ontario (hard water area) and Halifax, Nova Scotia (soft water area), Canada Children in b) significantly heavier ($p<0.001$) and slightly taller ($p=0.09$) than a). NA

CANADA; AGE; CHILDREN; SEX; NUTRITIONAL DEFICIENCIES; HAIR; CALCIUM; COPPER; MANGANESE; ZINC; DRINKING WATER; ENVIRONMENTAL EXPOSURE; DELIBERATE EXPOSURE
Gibson, R.S.; Anderson, B.M.; Scythes, C.A. 1983 American Journal of Clinical Nutrition 37:37-42

Tissue	Cases Exposure Route	Range	Mean	General Information
9912 Hair	a) 37 b) 74 c) 24 d) 14	a) Not given b) Not given c) Not given d) Not given	a) 182+/-10 ug/g b) 168+/-10 ug/g c) 157+/-14 ug/g d) 161+/-7 ug/g	a) Blond hair, 0-100 MU melanin b) Light brown hair, 101-200 MU melanin c) Dark brown hair, 201-300 MU melanin d) Black hair, >301 MU melanin Zn:Cu significantly higher in black hair (>301 MU melanin). 1-12 yr old healthy males, Brasilia, Brazil AAS

HAIR; BRAZIL; CHILDREN; ZINC; COPPER; MINERALS; METALS; ENVIRONMENTAL EXPOSURE
Dorea, J.G.; Pereira, S.E. 1983 Journal of Nutrition 113:2375-2381

Zinc
7440-66-6
Zn
AtW 65.38, MP 419.5 C, BP 908 C, VP 1 mm Hg at 487 C, 10 mm Hg at 590 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9018 Hair	6	a) 60-280 ug/g b) 25-280 ug/g c) 70-250 ug/g d) 60-230 ug/g e) 40-80 ug/g f) 70-120 ug/g Estimated from figure	a) 200 ug/g b) 170 ug/g c) 200 ug/g d) 190 ug/g e) 52 ug/g f) 88 ug/g	a) 0-40 cm from scalp, 7 yr old female b) 0-40 cm from scalp, 4 yr old female c) 0-30 cm from scalp, 7 yr old female d) 0-18 cm from scalp, 3 yr old female e) 0-15 cm from scalp, 2 yr old male f) 0-65 cm from scalp, 40 yr old female Range from total length, mean from 1st 10 cm from scalp. No definite concentration pattern due to difference among individuals. Japan NA

HAIR; ENVIRONMENTAL EXPOSURE; JAPAN; ADULTS; CHILDREN; COMPARATIVE EVALUATIONS; BROMINE; CALCIUM; CHLORINE; COPPER; IODINE; MAGNESIUM; MANGANESE; MERCURY; SELENIUM; ZINC; BIOINDICATORS

Yukawa, M.; Suzuki-Yasumoto, M.; Tanaka, S. 1984 Science of the Total Environment 38:41-54

Tissue	Cases Exposure Route	Range	Mean	General Information
9014 Intestine	a) 15 b) 13 c) 5	a) Not given b) Not given c) Not given	a) 3.38 b) 2.08 c) 2.60 Parts per thousand	a) Gastric carcinoma patients b) Patients with non-malignant intestinal disease c) Patients with malignant disease other than gastric carcinoma Mucosal samples, fixed in glutaraldehyde-acetone. Data for pyroantimonate-osmium fixation also reported. 45 males and females, ages 58.5-63.8 yr. Required surgical resection. X-ray microanaly

BLOOD PLASMA; INTESTINES; UNITED KINGDOM; CARCINOMAS; GASTROINTESTINAL DISEASES; COMPARATIVE EVALUATIONS; ZINC; MEASUREMENT METHODS

Elmes, M.E.; Clarkson, J.P.; Jones, J.G. 1984 Science of the Total Environment 34:49-56

Tissue	Cases Exposure Route	Range	Mean	General Information
9016 Kidney	32	Not given	266+/-45 ug/g Dry wt	Cortex. Positive correlation with age. Cd and Cd/Zn positively correlated with postmortem evidence of hypertension only if age, gender not included in multiple regression equation. 16-60 yr old Caucasians autopsied in 1979-1981. Also measured: heart wt, body wt, height. Selected from group of 60. Cancer, kidney failure, extensive wt loss cases excluded. West Virginia AAS

SELENIUM; CADMIUM; ZINC; COPPER; AUTOPSIES; KIDNEYS; WEST VIRGINIA; HYPERTENSION; TRACE ELEMENTS

Horvath, D.J.; Barber, F.W.; Thayne, W.V.; Frost, J.L. 1984 Biological Trace Element Research 6:225-236

Zinc
7440-66-6
Zn
AtW 65.38, MP 419.5 C, BP 908 C, VP 1 mm Hg at 487 C, 10 mm Hg at 590 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9016 Kidney	394	a) Not given b) Not given	a) 67.1+/-26.1 ug/g b) 52.8+/-33.4 ug/g	a) Smokers (8 or more cigarettes/day) b) Nonsmokers and those smoking 7 cigarettes or less/day. 0-94 yr olds from 8 regional hospitals, Japan AAS
9017 Liver	394	a) Not given b) Not given	a) 94.4+/-50.8 ug/g b) 54.1+/-28.4 ug/g	a) Smokers (8 or more cigarettes/day) b) Nonsmokers and those smoking 7 cigarettes or less/day Significantly different $p < 0.01$. 0-94 yr olds from 8 regional hospitals, Japan AAS
JAPAN; AUTOPSIES; HEART; KIDNEYS; LIVER; METALS; ZINC; POPULATION EXPOSURE; SMOKING; TOBACCOS; DELIBERATE EXPOSURE; COPPER; CADMIUM Iwao, S.; Tsuchiya, K.; Sugita, M. 1983 Archives of Environmental Health 38(3):156-162				

Tissue	Cases Exposure Route	Range	Mean	General Information
9016 Liver	36	a) 27.04-97.2 ug/g b) 26.0-71.7 ug/g	a) 52.33 ug/g b) 50.59 ug/g	a) 2 samples from 35 livers, 1 from 1, NA b) 2 sample from 24 of 36 livers, voltammetry Normal tissues from autopsies. Baltimore, MD, Minneapolis, MN; Seattle, WA NA; Voltammetry
LIVER; ENVIRONMENTAL EXPOSURE; AUTOPSIES; COMPARATIVE EVALUATIONS; MEASUREMENT METHODS; ALUMINUM; CADMIUM; COPPER; LEAD; MANGANESE; SELENIUM; ZINC Zeisler, R.; Harrison, S.H.; Wise, S.A. 1984 Biological Trace Element Research 6:31-40				

Tissue	Cases Exposure Route	Range	Mean	General Information
9019 Liver	96	a) 55-115 mg/kg b) 35-85 mg/kg	a) 82.4 +or- 21.0 mg/kg b) 59.1 +or- 13.5 mg/kg	a) Females b) Males Autopsies. Levels generally lower than those in other countries. No major regional variations. New Zealanders. Death by physical injuries AAS
LIVER; COMPARATIVE EVALUATIONS; ARSENIC; CADMIUM; CHROMIUM; COBALT; COPPER; NEW ZEALAND; AUTOPSIES; LEAD; MANGANESE; MERCURY; NICKEL; SELENIUM; SILVER; ZINC Pickston, L.; Lewin, J.P.; Drysdale, J.M.; Smith, J.M.; Bruce, J. 1983 Journal of Analytical Toxicology 7:2-6				

Zinc
7440-66-6
Zn
AtW 65.38, MP 419.5 C, BP 908 C, VP 1 mm Hg at 487 C, 10 mm Hg at 590 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9020 Milk		a) Not given b) Not given	a) 2.9 mg/l b) 0.9 ug/l	a) Early lactation (0-2 mo) b) Mature milk (4 mo) Sweden, Gothenburg, Ostra Sjukhuset (human milk bank) AAS
MILK; ZINC; CALCIUM; DIETS; LACTATION; ENVIRONMENTAL EXPOSURE; CONSUMER EXPOSURE Lonnerdal, B.; Cederblad, M.S.; Davidsson, L.; Sandstrom, B. 1984 American Journal of Clinical Nutrition 40: 1064-1070				

Tissue	Cases Exposure Route	Range	Mean	General Information
9021 Milk		a) Not given b) Not given c) Not given d) Not given e) Not given f) Not given g) Not given h) Not given i) Not given	a) 4 ug/ml b) 3 mg/ml c) 3.2 ug/ml d) 3.3 ug/ml e) 7.2 ug/ml f) 0.7 g/ml g) 0.8 ug/ml h) 1.0 ug/ml i) 1.3 ug/ml	a) Finland b) Italy c) New Zealand d) Guatemala e) Chile f) Sweden g) Turkey h) Hungary i) Yugoslavia In some countries, levels range from 1.5-2 ug/ml. a)-e) levels considered high, f)-i), marginal-to-low. Amount Zn in soil corresponds with levels in milk. Levels from database containing data on "normal" levels of 15 elements in 7 tissues/fluids. Data selected by 60 investigators in over 40 countries. Diet, environment both important in distribution of elements.
ZINC; COPPER; MANGANESE; SELENIUM; LEAD; CADMIUM; BLOOD; BLOOD SERUM; HAIR; MILK; BANGLADESH; INDIA; TURKEY; FINLAND; ITALY; NEW ZEALAND; GUATEMALA; CHILE; SWEDEN; HUNGARY; YUGOSLAVIA; POLAND; KENYA; EGYPT; SOUTH AFRICA; UNITED STATES; AUSTRALIA; GREECE; PAKISTAN; NIGERIA; PHILIPPINES; ZAIRE; THAILAND; CHINA; WYOMING; OHIO; CALIFORNIA; JAPAN; MEXICO; CANADA; ISRAEL; PERU; SPAIN; COMPARATIVE EVALUATIONS; BIOLOGICAL MONITORING; IRAN; DIETS; ENVIRONMENTAL EXPOSURE Iyengar, G.V. 1984 Science of the Total Environment 38:125-131				

Tissue	Cases Exposure Route	Range	Mean	General Information
9022 Milk	a) 21 b) 20 c) 18	a) Not given b) Not given c) Not given	a) 2.6+/-0.2 ug/ml b) 1.3+/-0.1 ug/ml c) 1.1+/-0.1 ug/ml	a) Lactating, 1 mo postpartum b) Lactating, 2 mo postpartum c) Lactating, 3 mo postpartum Mean dietary Zn 42% of RDA. 30+/-2 yr olds, Maryland AAS
MARYLAND; ADULTS; BLOOD PLASMA; ERYTHROCYTES; MILK; COMPARATIVE EVALUATIONS; DIETS; ZINC; LACTATION Moser, P.B.; Reynolds, R.D. 1983 American Journal of Clinical Nutrition 38:101-108				

Zinc
7440-66-6
Zn
AtW 65.38, MP 419.5 C, BP 908 C, VP 1 mm Hg at 487 C, 10 mm Hg at 580 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9023 Milk	a) 9 b) 17 c) 7	a) 20-132 mg/kg b) 15.2-68 mg/kg c) 2.4-23.4 mg/kg Dry wt	a) 62 +or- 37 mg/kg b) 34 +or- 16 mg/kg c) 10.8 +or- 8.1 mg/kg Dry wt	a) Colostrum (1st or 2nd day post partum) b) Transitional milk (3-8 days post partum) c) Mature milk (1-8 mo post partum) Slovenia, Yugoslavia NA

MILK; ARSENIC; CADMIUM; COBALT; COPPER; MERCURY; IODINE; MANGANESE; ANTIMONY; SELENIUM; VANADIUM; ZINC; YUGOSLAVIA; ENVIRONMENTAL EXPOSURE

Kosta, L.; Byrne, A.R.; Dermelj, M. 1983 Science of the Total Environment 29:261-268

Tissue	Cases Exposure Route	Range	Mean	General Information
9024 Placenta	251	4.8-15.7 ppm	9+/-1.6 ppm	113 cases Nagoya, Japan, 1974-1978. Normal deliveries. AAS

ZINC; MERCURY; METHYLMERCURY; LEAD; CADMIUM; MANGANESE; COPPER; IRON; JAPAN; BLOOD; PLACENTA; UMBILICAL CORD; METALS; ENVIRONMENTAL EXPOSURE

Tsuchiya, H.; Mitani, K.; Kodama, K.; Nakata, T. 1984 Archives of Environmental Health 39(1):11-17

Tissue	Cases Exposure Route	Range	Mean	General Information
9025 Placenta				Review. Discussion of relationship to specificity of fetal effects, follow-up, possible mechanisms of toxicity. Specimens from TX, CA, UT, NC, AL, GA, NY

PLACENTA; ALABAMA; BELGIUM; CALIFORNIA; GEORGIA; GERMANY; IOWA; JAPAN; MISSOURI; NEW JERSEY; NEW YORK; NORTH CAROLINA; OHIO; TENNESSEE; TEXAS; UNITED KINGDOM; UTAH; CADMIUM; COPPER; LEAD; MERCURY; MERCURY INORGANIC COMPOUNDS; MERCURY ORGANIC COMPOUNDS; ZINC; PREGNANCY; BEHAVIOR DISORDERS

Miller, R.K. 1984 American Journal of Industrial Medicine 4:205-244

Zinc
7440-66-6
Zn
AtW 65.38, MP 419.5 C, BP 908 C, VP 1 mm Hg at 487 C, 10 mm Hg at 590 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9026 Saliva	6 Ingestion	a) 27-95 ng/ml b) 27-94 ng/ml	a) 65+/-27 ng/ml b) 53+/-24 ng/ml	a) After 1 wk on diet with 15.7 mg Zn/d b) End of depletion period (4-9 wk when plasma Zn <70 ug/100 g) on diet with 0.28 mg Zn/d Data available on tissue levels during 2 wk repletions with various doses. Healthy volunteers, CA ES
9027 Semen	8 Ingestion	a) 31-434 ug/g b) 37-214 ug/g c) Not given d) Not given	a) 250+/-149 ug/g b) 107+/-76 ug/g c) 631+/-217ug d) 335+/-176 ug	a) After 1 wk on diet with 15.7 mg Zn/d b) End of depletion period (4-9 wk when plasma Zn <70 ug/100 g) on diet with 0.28 mg Zn/d c) Total per ejaculum, 1 wk on diet with 15.7 mg/d d) Total per ejaculum, end of depletion period Significant differences: a), b) and c), d) $p<0.05$. Data available on tissue levels during 2 wk repletions with various doses. Healthy volunteers, CA AAS

BLOOD; BLOOD PLASMA; ERYTHROCYTES; URINE; SALIVA; HAIR; SEMEN; DELIBERATE EXPOSURE; CALIFORNIA; ADULTS; NUTRITIONAL DEFICIENCIES; ZINC; DIETS
Baer, M.T.; King, J.C. 1984 American Journal of Clinical Nutrition 39:556-570

Tissue	Cases Exposure Route	Range	Mean	General Information
9026 Semen	a) 25 b) 25	a) 10-24 mg % b) 2.59-23.16 mg %	a) Not given b) 11.7+/-6.0 mg %	a) Fertile controls b) Infertile patients Abnormal sperm motility and morphology AAS

FERTILITY; CALCIUM; MAGNESIUM; ZINC; INDIA; ADULTS; SEMEN; SPERM
Pandy, V.K.; Parmeshwaran, M.; Soman, S.D.; Dacosta, J.C. 1983 Science of the Total Environment 27:49-52

Tissue	Cases Exposure Route	Range	Mean	General Information
9029 Umbilical cord	221	0.7-8.2 ppm	5.3+/-1.4 ppm	111 cases Nagoya, Japan, 1974-1978. AAS

ZINC; MERCURY; METHYLMERCURY; LEAD; CADMIUM; MANGANESE; COPPER; IRON; JAPAN; BLOOD; PLACENTA; UMBILICAL CORD; METALS; ENVIRONMENTAL EXPOSURE
Tsuchiya, H.; Mitani, K.; Kodama, K.; Nakata, T. 1984 Archives of Environmental Health 39(1):11-17

Zinc
7440-66-6
Zn
AtW 65.38, MP 419.5 C, BP 908 C, VP 1 mm Hg at 487 C, 10 mm Hg at 590 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9930 Urine	24 Ingestion	2-9 umol/day	5+/-2 umol/day	Intake, elderly men, 138 umol/day (range 86-210), women, 136 umol/day (range 46-194). Intake 60% of recommended 229 umol/day. Overall retention 1.0 umol/day-not significantly different from equilibrium. No apparent health effects from deficiency Healthy elderly (11 men, 73.3-85.2 yr (mean 78.2), 13 women 69.7-85.5 yr (mean 75.8)), Southampton, England AAS
BLOOD; BLOOD PLASMA; LEUKOCYTES; URINE; DELIBERATE EXPOSURE; UNITED KINGDOM; ADULTS; COPPER; ZINC; METALS				
Bunker, V.W.; Hinks, L.J.; Lawson, M.S.; Clayton, B.E. 1984 American Journal of Clinical Nutrition 40:1096-1102				

Tissue	Cases Exposure Route	Range	Mean	General Information
9931 Urine	9 Ingestion	a) Not given b) Not given c) Not given	a) 0.70+/-0.05 mg/day b) 0.70+/-0.08 mg/day c) 0.67+/-0.08 mg/day S.E.	a) Uncured b) Cured, 40 mg/kg nitrite c) Cured, 47 mg/kg nitrite + 200 mg/kg erythorbate 200 g/day cured or uncured sausage. 3 subjects/group, each set rotating to next group every 17 d. Pooled samples from day 6-16. Healthy, 21-27 yr old. Mean ht 180 cm, mean wt 75 kg AAS
BIOAVAILABILITY; IRON; ZINC; COPPER; DELIBERATE EXPOSURE; METABOLISM; URINE; BLOOD SERUM; UNITED STATES				
Greger, J.L.; Lee, K.; Graham, K.L.; Chinn, B.L.; Liebert, J.C. 1984 Journal of Agricultural and Food Chemistry 32:861-865				

Tissue	Cases Exposure Route	Range	Mean	General Information
9932 Urine	a) 31 b) 19 c) 21 d) 29	a) 0.81+/-1.5-0.46+/-2.2 mg b) 0.86+/-1.3-0.87+/-1.3 mg c) 0.33+/-1.3-0.33+/-1.4 mg d) 0.26+/-1.6-0.52+/-1.2 mg /g creatinine	a) Not given b) Not given c) Not given d) Not given	a) Controls, non-exposed b) Patients with itai-itai disease - renal damage and bone lesions c) Patients suspected of having disease - renal damage, no obvious bone lesions d) Exposed - no bone or renal disorders, range of means a-d) environmentally exposed. 30-70 yr old women AAS
URINE; BLOOD SERUM; ENVIRONMENTAL EXPOSURE; JAPAN; COPPER; CADMIUM; ZINC; KIDNEY DISEASES				
Nogawa, K.; Yamada, Y.; Honda, R.; Tsuritani, I.; Kobayashi, E.; Ishizaki, M. 1984 Environmental Research 33:29-38				

Zinc
7440-66-6
Zn
AtW 65.38, MP 419.5 C, BP 906 C, VP 1 mm Hg at 487 C, 10 mm Hg at 590 C

Tissue	Cases Exposure Route	Range	Mean	General Information
0053 Urine	6	a) Not given b) Not given	a) 711+/-406 ug/d b) 480+/-343 ug/d	a) Day of 6 mi run b) Non-run day Significant difference ($p<0.05$). Fasted from 10 hr before to 2 hr after run. Also measured phosphate. 28-46 yr old male runners AAS
BLOOD SERUM; URINE; CALCIUM; CHROMIUM; COPPER; POTASSIUM; SODIUM; ZINC; TRACE ELEMENTS; ADULTS Anderson, R.A.; Polansky, M.M.; Bryden, N.A. 1984 Biological Trace Element Research 6:327-336				

Tissue	Cases Exposure Route	Range	Mean	General Information
0054 Urine	6 Ingestion	a) 226-966 ug b) 47-510 ug /24 hr	a) 448+/-274 ug b) 142+/-161 ug /24 hr	a) After 1 wk on diet with 15.7 mg Zn/d b) End of depletion period (4-9 wk when plasma Zn <70 ug/100 g) on diet with 0.28 mg Zn/d Significant difference, $p<0.01$. Significant correlation ($r=0.527$, $p<0.01$) with plasma levels when urinary levels >150 ug/24 hr. Only one >100 ug/24 hr. Data available on tissue levels during 2 wk repletions with various doses. Healthy volunteers, CA AAS
BLOOD; BLOOD PLASMA; ERYTHROCYTES; URINE; SALIVA; HAIR; SEMEN; DELIBERATE EXPOSURE; CALIFORNIA; ADULTS; NUTRITIONAL DEFICIENCIES; ZINC; DIETS Beer, M.T.; King, J.C. 1984 American Journal of Clinical Nutrition 39:556-570				

Tissue	Cases Exposure Route	Range	Mean	General Information
0055 Urine	10 Injection	0-0.8 mg/hr	Not applicable	0-10 hr, peak (2.6 mg/hr) at 2 hr after 1-hr IV infusion of 20 mg EDTA/kg in 5% glucose. Range of means. Gun metal founders employed at factory 7-15 yr. Mean age 51 yr. AAS
URINE; BLOOD PLASMA; OCCUPATIONAL EXPOSURE; JAPAN; ADULTS; METAL POISONING; LEAD POISONING; COPPER; LEAD; ZINC; METALS; BIOACCUMULATION; INDUSTRIAL POLLUTION; BIOCONCENTRATION Aono, H.; Araki, S. 1984 International Archives of Occupational and Environmental Health 55:13-18				

Tissue	Cases Exposure Route	Range	Mean	General Information
0056 Urine	1	Not applicable	406 ug/24 hr	Measured on admission (Normal level 424+/-163 ug/24 hr). 18 yr old Pakistani with pyoderma gangrenosum
BLOOD PLASMA; BLOOD; URINE; HAIR; LEUKOCYTES; ITALY; ADULTS; SKIN DISEASES; ZINC; BIOACCUMULATION; BIOLOGICAL MONITORING; MINERAL METABOLISM Hambidge, K.M.; Norris, D.A.; Githens, J.H.; Ambruso, D.; Catalanotto, F.A. 1984 Journal of Pediatrics 106(3):450-451				

Zinc
7440-66-6
Zn
AtW 65.38, MP 419.5 C, BP 908 C, VP 1 mm Hg at 487 C, 10 mm Hg at 590 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9067 Urine	72 Inhalation	a) 62-1044 ug b) 109-673 ug c) 148-707 ug d) 97-837 ug e) 198-626 ug f) 226-1026 ug g) 157-704 ug h) 267-1064 ug /g creatinine	a) 392+/-186 ug b) 341+/-134 ug c) 417+/-154 ug d) 359+/-174 ug e) 363+/-154 ug f) 461+/-237 ug g) 365+/-167 ug h) 601+/-276 ug /g creatinine	a) Controls, 0 wks, 27 cases b) Controls, 16 wks, 27 cases c) Vitamin C treatment, 0 wks, 25 cases d) Vitamin C treatment, 16 wks, 25 cases e) Controls, 0 wks, 10 cases f) Controls, 8 wks, 10 cases g) Zinc treatment, 0 wks, 10 cases h) Zn treatment, 8 wks, 10 cases Vitamin C dose was 1 g/d, 5 d/wk. Zinc as Zn glutamate dose was 60 mg/d, 5 d/wk. No significant difference between control and treatment groups. 21-64 yr old workers at primary Pb smelter, 0.5-42 years exposure AAS

BLOOD; URINE; OCCUPATIONAL EXPOSURE; ADULTS; LEAD POISONING; METAL POISONING; INDUSTRIAL MEDICINE; CADMIUM; LEAD; MERCURY; ZINC; BIOACCUMULATION; HEALTH HAZARDS; INDUSTRIAL ATMOSPHERES; INDUSTRIAL PLANTS; INHALATION; OCCUPATIONAL HAZARDS; VITAMINS; VITAMIN C

Lauwerys, R.; Roels, H.; Buchet, J.-P.; Bernard, A.-A.; Verhoeven, L.; Konings, J. 1983 Journal of Occupational Medicine 25(9): 668-676

Tissue	Cases Exposure Route	Range	Mean	General Information
9068 Urine	7	a) 0-0.2 mg/hr b) 2.1-3.7 mg/hr c) 2.1-3.5 mg/hr d) 1.35-3.6 mg/hr e) 0.8-2.4 mg/hr f) 0.15-0.5 mg/hr g) 0.05-0.2 mg/hr h) 0.01-0.15 mg/hr	a) 0.05 mg/hr b) 2.9 mg/hr c) 2.6 mg/hr d) 2.5 mg/hr e) 1.4 mg/hr f) 0.35 mg/hr g) 0.10 mg/hr h) 0.07 mg/hr	a) 24 hr before-0 hr b) 0-1 hr c) 1-2 hr d) 2-4 hr e) 4-6 hr f) 6-12 hr g) 12-24 hr h) 24-48 hr 1 hr 20 mg/kg CaEDTA IV infusion started at time 0. Estimated from graph. Adults with blood Pb 46-67 ug/100 g, 46-59 yr, employed at gun metal foundry 6-14 yr AAS

BLOOD; BLOOD PLASMA; ERYTHROCYTES; URINE; OCCUPATIONAL EXPOSURE; ADULTS; LEAD; ZINC

Araki, S.; Aono, H.; Fukuhori, M.; Tabuki, K. 1986 Archives of Environmental Health 39(5):363-367

Zinc, (dihydrogen 3,7,12,17-tetramethyl-8,13-divinyl-2,18-porphinedipropionate(2-))- (8 CI) Zinc, (7,12-diethenyl-3,8,13,17-tetramethyl-21H,23H-porphine-2,18-dipropanoato(2-)-N(2 1),N(22),N(23),N(24))-, (SP-4-2)- (9 CI)
15442-64-5
C34-H30-N4-O4-Zn.3H
MW 626.08

Tissue	Cases Exposure Route	Range	Mean	General Information
9080 Blood		a) 0.15-0.43 mmol b) 0.26-1.41 mmol c) 0.25-1.01 mmol d) 0.16-1.55 mmol e) 0.16-0.82 mmol f) 0.20-2.43 mmol g) 0.16-0.52 mmol h) 0.16-1.68 mmol i) 0.17-0.68 mmol j) 0.16-2.15 mmol k) 0.19-0.48 mmol /mmol Hb	a) 0.20 mmol b) 0.52 mmol c) 0.51 mmol d) 0.39 mmol e) 0.35 mmol f) 0.51 mmol g) 0.25 mmol h) 0.50 mmol i) 0.25 mmol j) 0.24 mmol k) 0.20 mmol /mmol Hb	a) Controls, no smelter b) Preschoolers, 2 yr before filter c) School children, 2 yr before filter d) Mothers, 2 yr before filter e) Preschoolers, 2 yr after filter f) School children, 2 yr after filter g) Mothers, 2 yr after filter h) School children, 3 yr after filter i) Mothers, 3 yr after filter j) School children, 4 yr after filter k) Mothers, 4 yr after filter Range and mean estimated from graph. Values for control mothers and children combined. 32 families from Mezа Valley, Yugoslavia, 21 families from area with no smelter Hematofluorometer

BLOOD; ENVIRONMENTAL EXPOSURE; YUGOSLAVIA; ADULTS; CHILDREN; LEAD; ZINC ORGANIC COMPOUNDS; AIR POLLUTION; INDUSTRIAL EMISSIONS; BIOACCUMULATION; BIOLOGICAL MONITORING; SMELTERS

Prpic-Majic, D.; Mecsner, J.; Telisman, S.; Kersanc, A. 1984 Science of the Total Environment 32:277-288

Tissue	Cases Exposure Route	Range	Mean	General Information
9040 Blood	a) 671 b) 96 c) 144	a) Not given b) Not given c) Not given	a) 49.6+/-26.8ug/dl b) 42.2+/-20.4 ug/dl c) 39.8+/-16.5 ug/dl	a) Active smelter workers b) Retirees and ex-employees of smelter c) Copper and gold miners, never employed in smelter Data also given for different job catagories of smelter workers Hematofluorometer

BLOOD; URINE; OCCUPATIONAL EXPOSURE; ADULTS; CADMIUM; LEAD; ARSENIC; INDUSTRIAL PLANTS; SMELTERS; ZINC ORGANIC COMPOUNDS

Lilis, R.; Valciukas, J.A.; Weber, J.P.; Fischbein, A.; Nicholson, W.J.; Campbell, C.; Malkin, J.; Selikoff, I.J. 1984 Environmental Research 33:76-95

Zinc, (dihydrogen 3,7,12,17-tetramethyl-8,13-divinyl-2,18-porphinedipropionate(2-))- (8 CI) Zinc, (7,12-diethenyl-3,8,13,17-tetramethyl-21H,23H-porphine-2,18-dipropanoato(2-)-N(2 1),N(22),N(23),N(24))-, (SP-4-2)- (9 CI)
15442-64-5
C34-H30-N4-O4-Zn.2H
MW 626.03

Tissue	Cases Exposure Route	Range	Mean	General Information
9941 Blood	52	34-540 ug/dl	139.3 ug/dl	Automobile assembly plant workers chronically exposed to low levels of inorganic Pb. 52% had levels below 100 ug/dl. Workers employed from less than 1 to <10 yr, mean ages 36.5+/-13.4 yr. Nonexposed controls, used in eye movement tests, mean age 37.9+/-13 yr Age effects on saccadic eye movement in controls disrupted in exposed. Effects of Pb greater in younger workers. Authors suggest quantitative assessment of eye movements may be important in studying subclinical CNS dysfunction resulting from Pb-exposure Oculomoter function tests: Exposed showed decrease in saccade accuracy, increase in overshoots. Maximum velocity was lowered, but not significantly. Hematofluorimetry

LEAD; OCCUPATIONAL EXPOSURE; BLOOD; NEUROLOGIC MANIFESTATIONS; PROTOPORPHYRINS; AUTOMOTIVE; INDUSTRIAL PLANTS; LEAD POISONING; METAL POISONING

Glickman, L.; Valciukas, J.A.; Lilis, R.; Weisman, I. 1984 International Archives of Occupational and Environmental Health 54:115-125

Tissue	Cases Exposure Route	Range	Mean	General Information
9942 Blood	a) 114 b) 131 c) 48 d) 54	a) 0.5-1.8 ug/g Hb b) 0.5-2.4 ug/g Hb c) 0.7-1.9 ug/g Hb d) 0.6-2.4 ug/g Hb	a) 0.97+/-0.25 ug/g Hb b) 0.93+/-0.24 ug/g Hb c) 1.02+/-0.23 ug/g Hb d) 1.09+/-0.35 ug/g Hb	a) Unexposed male factory workers b) Exposed male workers c) Unexposed female factory workers d) Exposed female workers. Levels considered within normal range. Exposure was to Hg vapor. Measured zinc-protoporphyrin. Male and female factory workers, ages 30.9 and 29.9 yr, exposure durations 4.8 and 7 yr. Matched controls. Belgium Fluorimetry

MERCURY; BLOOD; URINE; OCCUPATIONAL EXPOSURE; SEX; BELGIUM; HEALTH HAZARDS; OCCUPATIONAL HAZARDS; INHALATION; LEAD; CADMIUM; ZINC; INDUSTRIAL ATMOSPHERES; BIOINDICATORS; NEUROLOGIC MANIFESTATIONS

Roels, H.; Gennart, J.-P.; Lauwerys, R.; Buchet, J.-P.; Malchaire, J.; Bernard, A. 1984 American Journal of Industrial Medicine 7:45-71

Tissue	Cases Exposure Route	Range	Mean	General Information
9943 Blood, cells	a) 96 b) 22	a) 40-972 umol b) 53-76 umol /mol Hb	a) 317 umol b) 68 umol /mol Hb	a) Smelter employees b) Controls Controls matched for age and sex. 26-67 yr old (mean 51) smelter employees, mean exposure 22 yr (range 9-45) and non-exposed controls, Denmark Hematofluorimeter

BLOOD; ERYTHROCYTES; OCCUPATIONAL EXPOSURE; DENMARK; ADULTS; LEAD; HEALTH HAZARDS; SMELTERS; COMPARATIVE EVALUATIONS; PROTOPORPHYRINS; ZINC ORGANIC COMPOUNDS

Kirkby, H; Nielsen, C.J.; Nielsen, V.K.; Gyntelberg, F. 1983 British Journal of Industrial Medicine 40:314-317

1,1'-Biphenyl, 2,2',3,3',4,4',5-heptachloro-
35065-30-6
C12-H3-Cl7
MW 395

Tissue	Cases Exposure Route	Range	Mean	General Information
9044 Blood				Review of the relative toxicity of the individual congeners of PCBs and PCDFs identified in tissues of Yusho patients.

REVIEW; POLYCHLORINATED BIPHENYLS; ENVIRONMENTAL EXPOSURE; POLYCHLORINATED DIBENZOFURANS; ADIPOSE TISSUE; BLOOD; LIVER; JAPAN; TAIWAN
Masuda, Y.; Yoshimura, H. 1984 American Journal of Industrial Medicine 5:31-44

1,1'-Biphenyl, 2,2',3,4,4',5,5'-heptachloro-
35065-29-3
C12-H3-Cl7
MW 395

Tissue	Cases Exposure Route	Range	Mean	General Information
9045 Adipose	7 Ingestion	0.02-0.20 ppm	Not given	Subjects ate meat contaminated with PBBs and PCBs. Healthy volunteers, 20-30 yr old GC/MS

ADIPOSE TISSUE; ENVIRONMENTAL EXPOSURE; MICHIGAN; ADULTS; BIOPSIES; BROMINATED HYDROCARBONS; CHLORINATED HYDROCARBONS; DDT; DDE; DIELDRIN; FATS; LIPIDS; PESTICIDES; POLYBROMINATED BIPHENYLS; POLYCHLORINATED BIPHENYLS; ANIMAL FEEDS; ACCIDENTAL POISONING; AGRICULTURE; BIOACCUMULATION; BIOLOGICAL MONITORING; FIRE RETARDANTS; FOOD ADDITIVES; FOOD CONTAMINATION; HEALTH HAZARDS; MEAT; PESTICIDE RESIDUES; POPULATION EXPOSURE
Schnare, D.W.; Ben, M.; Shields, M.G. 1984 Ambio 13(5-6):378-380

Tissue	Cases Exposure Route	Range	Mean	General Information
9046 Blood				Review of the relative toxicity of the individual congeners of PCBs and PCDFs identified in tissues of Yusho patients.

REVIEW; POLYCHLORINATED BIPHENYLS; ENVIRONMENTAL EXPOSURE; POLYCHLORINATED DIBENZOFURANS; ADIPOSE TISSUE; BLOOD; LIVER; JAPAN; TAIWAN
Masuda, Y.; Yoshimura, H. 1984 American Journal of Industrial Medicine 5:31-44

1,1'-Biphenyl, 2,2',4,4',5,5'-hexabromo-
59080-40-9
C12-H4-Br6
MW 627.40, MP 72 C, VP 0.000076 mm Hg at 90 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9947 Adipose	7 Ingestion	0.01-2.72 ppm	Not given	Subjects ate meat contaminated with PBBs and PCBs. Level of detection 0.001 ppm. Healthy volunteers, 20-30 yr old GC/MS
ADIPOSE TISSUE; ENVIRONMENTAL EXPOSURE; MICHIGAN; ADULTS; BIOPSIES; BROMINATED HYDROCARBONS; CHLORINATED HYDROCARBONS; DDT; DDE; DIELDRIN; FATS; LIPIDS; PESTICIDES; POLYBROMINATED BIPHENYLS; POLYCHLORINATED BIPHENYLS; ANIMAL FEEDS; ACCIDENTAL POISONING; AGRICULTURE; BIOACCUMULATION; BIOLOGICAL MONITORING; FIRE RETARDANTS; FOOD ADDITIVES; FOOD CONTAMINATION; HEALTH HAZARDS; MEAT; PESTICIDE RESIDUES; POPULATION EXPOSURE Schnare, D.W.; Ben, M.; Shields, M.G. 1984 Ambio 13(5-6):378-380				

1,1'-Biphenyl, 2,2',4,4',5,5'-hexachloro-
35065-27-1
C12-H4-Cl6
MW 361

Tissue	Cases Exposure Route	Range	Mean	General Information
9948 Adipose	7 Ingestion	0.09-0.73 ppm	Not given	Subjects ate meat contaminated with PBBs and PCBs. Healthy volunteers, 20-30 yr old GC/MS
ADIPOSE TISSUE; ENVIRONMENTAL EXPOSURE; MICHIGAN; ADULTS; BIOPSIES; BROMINATED HYDROCARBONS; CHLORINATED HYDROCARBONS; DDT; DDE; DIELDRIN; FATS; LIPIDS; PESTICIDES; POLYBROMINATED BIPHENYLS; POLYCHLORINATED BIPHENYLS; ANIMAL FEEDS; ACCIDENTAL POISONING; AGRICULTURE; BIOACCUMULATION; BIOLOGICAL MONITORING; FIRE RETARDANTS; FOOD ADDITIVES; FOOD CONTAMINATION; HEALTH HAZARDS; MEAT; PESTICIDE RESIDUES; POPULATION EXPOSURE Schnare, D.W.; Ben, M.; Shields, M.G. 1984 Ambio 13(5-6):378-380				

Tissue	Cases Exposure Route	Range	Mean	General Information
9949 Blood				Review of the relative toxicity of the individual congeners of PCBs and PCDFs identified in tissues of Yusho patients.
REVIEW; POLYCHLORINATED BIPHENYLS; ENVIRONMENTAL EXPOSURE; POLYCHLORINATED DIBENZOFURANS; ADIPOSE TISSUE; BLOOD; LIVER; JAPAN; TAIWAN Masuda, Y.; Yoshimura, H. 1984 American Journal of Industrial Medicine 5:31-44				

1,1'-Biphhenyl, 2,2',3,4,4',5'-hexachloro-
35065-26-2
C12-H4-Cl6
MW 361

Tissue	Cases Exposure Route	Range	Mean	General Information
9950 Adipose	7 Ingestion	0.01-0.37 ppm	Not given	Subjects ate meat contaminated with PBBs and PCBs. Healthy volunteers, 20-30 yr old GC/MS
ADIPOSE TISSUE; ENVIRONMENTAL EXPOSURE; MICHIGAN; ADULTS; BIOPSIES; BROMINATED HYDROCARBONS; CHLORINATED HYDROCARBONS; DDT; DDE; DIELDRIN; FATS; LIPIDS; PESTICIDES; POLYBROMINATED BIPHENYLS; POLYCHLORINATED BIPHENYLS; ANIMAL FEEDS; ACCIDENTAL POISONING; AGRICULTURE; BIOACCUMULATION; BIOLOGICAL MONITORING; FIRE RETARDANTS; FOOD ADDITIVES; FOOD CONTAMINATION; HEALTH HAZARDS; MEAT; PESTICIDE RESIDUES; POPULATION EXPOSURE Schnare, D.W.; Ben, M.; Shields, M.G. 1984 Ambio 13(5-6):378-380				

Tissue	Cases Exposure Route	Range	Mean	General Information
9951 Blood				Review of the relative toxicity of the individual congeners of PCBs and PCDFs identified in tissues of Yusho patients.
REVIEW; POLYCHLORINATED BIPHENYLS; ENVIRONMENTAL EXPOSURE; POLYCHLORINATED DIBENZOFURANS; ADIPOSE TISSUE; BLOOD; LIVER; JAPAN; TAIWAN Masuda, Y.; Yoshimura, H. 1984 American Journal of Industrial Medicine 5:31-44				

1,3,4-Metheno-1H-cyclobuta(cd)pentalene, 1,1a,2,2,3,3a,4,5,5,5a,5b-undecachlorooctahydro-
39801-14-4
C10-H-Cl11
MW 511.06

Tissue	Cases Exposure Route	Range	Mean	General Information
9952 Adipose	a) 91 b) 84	a) Not detected-60 ng/g b) Not detected-30 ng/g	a) 9+/-11 ng/g b) 6+/-4 ng/g	a) Kingston b) Ottawa Single samples from greater omentum of each cadaver. Significantly different - frequency of occurrence was low, thus hard to assess how meaningful. In general, residue values in entire survey of 20 compounds slightly higher in Kingston. No significant differences by sex. Autopsies, unembalmed cadavers, 11/79-1/81, Kingston, Ontario (a Great Lakes Community) and 11/80-1/81, Ottawa, Ontario (outside Great Lakes Basin), Canada. Age ranges 7-88 yr, 16-91 yr, respectively. GC/MS
ADIPOSE TISSUE; CANADA; AUTOPSIES; PESTICIDES; ENVIRONMENTAL EXPOSURE; CHLORINE ORGANIC COMPOUNDS; CHLOROBENZENES; WATER POLLUTION Williams, D.T.; LeBel, G.L.; Junkins, E. 1984 Journal of Toxicology and Environmental Health 13:19-29				

1,3,4-Metheno-1H-cyclobuta(cd)pentalene, 1,1a,2,2,3,3a,4,5,5,5a,5b,6-do decachlorooctahydro-
2385-85-5
C10-Cl12
MW 545.59, MP 485 C, VP 6X10(E-6) mm Hg at 25 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9053 Adipose	a) 91 b) 84	a) Not detected-190 ng/g b) Not detected-120 ng/g	a) 27+/-36 ng/g b) 11+/-16 ng/g	a) Kingston b) Ottawa Single samples from greater omentum of each cadaver. Significantly different. In general, residue values in entire survey of 20 compounds slightly higher in Kingston. No significant differences by sex. Cities significantly different. Autopsies, unembalmed cadavers, 11/79-1/81, Kingston, Ontario (a Great Lakes Community) and 11/80-1/81, Ottawa, Ontario (outside Great Lakes Basin), Canada. Age ranges 7-86 yr, 16-91 yr, respectively. GC/MS
ADIPOSE TISSUE; CANADA; AUTOPSIES; PESTICIDES; ENVIRONMENTAL EXPOSURE; CHLORINE ORGANIC COMPOUNDS; CHLOROBENZENES; WATER POLLUTION Williams, D.T.; LeBel, G.L.; Junkins, E. 1984 Journal of Toxicology and Environmental Health 13:19-29				

Tissue	Cases Exposure Route	Range	Mean	General Information
9054 Milk	a) 9 b) 8 c) 2 d) 6 e) 16 f) 6	a) <0.01-0.8 ng/g b) 0.01-6.00 ng/g c) 0.06-0.06 ng/g d) 0.04-0.14 ng/g e) <0.01-0.21 ng/g f) 0.10-0.26 ng/g Wet wt	a) Not given b) Not given c) Not given d) 0.07+/-0.036 ng/g e) 0.12+/-0.074 ng/g f) 0.162+/-0.059 ng/g Wet wt	a) Colostrum, Albany b) Colostrum, Oswego c) Colostrum, Rochester d) Milk, Albany e) Milk, Oswego f) Milk, Rochester Random samples. Women living near Lake Ontario and controls (Albany). Sampled May-Dec 1977 GC-EC; GC/MS
NEW YORK; ADULTS; NEWBORN; MILK; MEASUREMENT METHODS; PESTICIDES; FIRE RETARDANTS; FOOD CONTAMINATION; WATER POLLUTION; ENVIRONMENTAL EXPOSURE; CONSUMER EXPOSURE Bush, B.; Snow, J.; Conner, L.; Ruechert, Y.; Dymerski, P.; Hilker, D. 1983 Archives of Environmental Contamination and Toxicology 12:739-746				

Tissue	Cases Exposure Route	Range	Mean	General Information
9055 Milk	a) 54 b) 102	a) None detected b) None detected-0.25 ppm	b) None detected b) Not given	a) Hawaii b) Mainland USA Sampled up to 1 mo postpartum. Lipid basis. 1979-80 GC
HAWAII; UNITED STATES; ADULTS; MILK; ALDRIN; CHLORINATED HYDROCARBONS; CHLORINE ORGANIC COMPOUNDS; DDD; DDE; DDT; DIELDRIN; HEPTACHLOR EPOXIDE; HEPTACHLOROCYCLOHEXANE; HEXACHLOROBENZENE; LINDANE; NONACHLOR; OXYCHLORDANE; POLYCHLORINATED BIPHENYLS; PESTICIDE RESIDUES; POPULATION EXPOSURE; ENVIRONMENTAL EXPOSURE Takei, G.H.; Kauahikaua, S.M.; Leong, G.H. 1983 Bulletin of Environmental Contamination and Toxicology 30:606-613				

1,4:5,8-Dimethanonaphthalene, 1,2,3,4,10,10-hexachloro-1,4,4a,5,8,8a-hexahydro-, endo,exo- (8 CI) 1,4:5,8-Dimethanonaphthalene, 1,2,3,4,10,10-hexachloro-1,4,4a,5,8,8a-hexahydro-, (1alpha,4alpha,4abeta,5alpha,8alpha,8abeta)- (9 CI)
309-00-2
C12-H8-Cl6
MW 365.88, MP 164 C, VP 6X10(E-6) mm Hg at 25 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9056 Blood	56	a) Not detected-31.0 ppb b) Not detected-97.4 ppb c) Not detected-106.1 ppb d) Not detected-62.8 ppb	a) 5.6 ppb b) 33.3 ppb c) 16.7 ppb d) 19.1 ppb	a) Maternal, live births, 27 cases b) Maternal, stillbirths, 9 cases c) Cord, live births, 27 cases d) Cord, stillbirths, 9 cases Significant difference between a), b) ($p<0.01$) and c), d) ($p<0.05$) Pregnant women, Lucknow, India GC-EC; TLC
INDIA; ADULTS; NEWBORN; BLOOD; PLACENTA; ALDRIN; CHLORINE ORGANIC COMPOUNDS; DDD; DDE; DDT; HEXACHLOROCYCLOHEXANE; LINDANE; BIOACCUMULATION; METABOLITES; PESTICIDE RESIDUES; POPULATION EXPOSURE; PREGNANCY; ENVIRONMENTAL EXPOSURE Saxena, M.C.; Siddiqui, M.K.J.; Agarwal, V.; Kuuty, D. 1983 Journal of Toxicology and Environmental Health 11:71-79				

Tissue	Cases Exposure Route	Range	Mean	General Information
9057 Milk	a) 54 b) 102	a) None detected b) None detected-0.10 ppm	a) None detected b) 0.082+/-0.019 ppm	a) Hawaii b) Mainland USA Sampled up to 1 mo postpartum. Lipid basis. Mean of positive residues. 1979-80 GC
HAWAII; UNITED STATES; ADULTS; MILK; ALDRIN; CHLORINATED HYDROCARBONS; CHLORINE ORGANIC COMPOUNDS; DDD; DDE; DDT; DIELDRIN; HEPTACHLOR EPOXIDE; HEPTACHLOROCYCLOHEXANE; HEXACHLOROBENZENE; LINDANE; NONACHLOR; OXYCHLORDANE; POLYCHLORINATED BIPHENYLS; PESTICIDE RESIDUES; POPULATION EXPOSURE; ENVIRONMENTAL EXPOSURE Tabei, G.H.; Kanahiwa, S.M.; Leong, G.H. 1983 Bulletin of Environmental Contamination and Toxicology 30:606-613				

Tissue	Cases Exposure Route	Range	Mean	General Information
9058 Placenta	a) 27 b) 9	a) Not detected-83.3 ppb b) Not detected-83.3 ppb	a) 6.0 ppb b) 31.7 ppb	a) Live births b) Stillbirths Significant difference ($p<0.01$) Pregnant women, Lucknow, India GC-EC; TLC
INDIA; ADULTS; NEWBORN; BLOOD; PLACENTA; ALDRIN; CHLORINE ORGANIC COMPOUNDS; DDD; DDE; DDT; HEXACHLOROCYCLOHEXANE; LINDANE; BIOACCUMULATION; METABOLITES; PESTICIDE RESIDUES; POPULATION EXPOSURE; PREGNANCY; ENVIRONMENTAL EXPOSURE Saxena, M.C.; Siddiqui, M.K.J.; Agarwal, V.; Kuuty, D. 1983 Journal of Toxicology and Environmental Health 11:71-79				

1,4:5,8-Dimethanonaphthalene, 1,2,3,4,10,10-hexachloro-6,7-epoxy-1,4,4a,5,6,7,8,8a-octahydro-, endo,exo- (8 CI) 2,7:3,6-Dimethanonaphth(2,3-b)oxirene, 3,4,5,6,9,9-hexachloro-1a,2,2a,3,6,6a,7,7a-octahydro-, (1aalpha,2beta,2aalpha,3beta,6beta,6aalpha,7beta,7aalpha)- (9 CI)
60-57-1
C12-H8-Cl6-O
MW 380.88, MP 176-177 C, VP 7.76X10(E-7) mm Hg at 20 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9060 Adipose	a) 91 b) 64	a) Not detected-120 ng/g b) Not detected-130 ng/g	a) 36+/-28 ng/g b) 43+/-28 ng/g	a) Kingston b) Ottawa Single samples from greater omentum of each cadaver. In general, residue values in entire survey of 20 compounds slightly higher in Kingston. No significant differences by sex Autopsies, unembalmed cadavers, 11/79-1/81, Kingston, Ontario (a Great Lakes Community) and 11/80-1/81, Ottawa, Ontario (outside Great Lakes Basin), Canada. Age ranges 7-88 yr, 16-91 yr, respectively. GC/MS
ADIPOSE TISSUE; CANADA; AUTOPSIES; PESTICIDES; ENVIRONMENTAL EXPOSURE; CHLORINE ORGANIC COMPOUNDS; CHLOROBENZENES; WATER POLLUTION Williams, D.T.; LeBel, G.L.; Junkins, E. 1984 Journal of Toxicology and Environmental Health 13:19-29				

Tissue	Cases Exposure Route	Range	Mean	General Information
9060 Adipose	7 Ingestion	0.06-0.14 ppm	Not given	Subjects ate meat contaminated with chlorinated pesticides Healthy volunteers, 20-30 yr old GC/MS
ADIPOSE TISSUE; ENVIRONMENTAL EXPOSURE; MICHIGAN; ADULTS; BIOPSIES; BROMINATED HYDROCARBONS; CHLORINATED HYDROCARBONS; DDT; DDE; DIELDRIN; FATS; LIPIDS; PESTICIDES; POLYBROMINATED BIPHENYLS; POLYCHLORINATED BIPHENYLS; ANIMAL FEEDS; ACCIDENTAL POISONING; AGRICULTURE; BIOACCUMULATION; BIOLOGICAL MONITORING; FIRE RETARDANTS; FOOD ADDITIVES; FOOD CONTAMINATION; HEALTH HAZARDS; MEAT; PESTICIDE RESIDUES; POPULATION EXPOSURE Schnare, D.W.; Ben, M.; Shields, M.G. 1984 Ambio 13(5-6):378-380				

Tissue	Cases Exposure Route	Range	Mean	General Information
9061 Blood	16	a) Not given b) Not given c) Not given d) Not given e) Not given f) Not given g) Not given h) Not given	a) 0.1 ng b) Trace (<0.05) c) 0.2 ng d) 0.2 ng e) Trace (<0.05) f) Trace (<0.05) g) Trace (<0.05) h) Not detected /g whole blood	a) 7 d after parturition b) 14 d c) 28 d d) 42 d e) 56 d f) 70 d g) 84 d H) 98 d Average of samples collected at each time period. No correlation between levels in milk and blood. Mothers, mean age 35+/-2 yr, mean wt 125+/-8 lb, National Capital Region, (Ottawa), Canada GC
BLOOD; MILK; ENVIRONMENTAL EXPOSURE; CANADA; ADULTS; PESTICIDES; POLYCHLORINATED BIPHENYLS; CHLORINE ORGANIC COMPOUNDS; LACTATION; PESTICIDE RESIDUES; DIELDRIN; DDT; DDE; OXYCHLORDANE; NONACHLOR; HEPTACHLOR EPOXIDE; HEXACHLOROBENZENE; BIOACCUMULATION Mes, J.; Doyle, J.A.; Adams, B.R.; Davies, D.J.; Turton, D. 1984 Archives of Environmental Contamination and Toxicology 13:217-223				

1,4:5,8-Dimethanonaphthalene, 1,2,3,4,10,10-hexachloro-6,7-epoxy-1,4,4a,5,6,7,8,8a-o ctahydro-, endo,exo- (8 CI) 2,7:3,6-Dimethanonaphth(2,3-b)oxirene, 3,4,5,6,9,9-hexachloro-1a,2,2a,3,6,6a,7,7a-o ctahydro-, (1aalpha,2beta,2aalpha,3beta,6beta,6aalpha,7beta,7aalpha)- (9 CI)
60-57-1
C12-H8-Cl6-O
MW 380.93, MP 176-177 C, VP 7.78X10(E-7) mm Hg at 20 C

Tissue	Cases Exposure Route	Range	Mean	General Information
0062 Blood, serum	a) 7 b) 8 c) 9 d) 7	a) Not given b) Not given c) Not given d) Not given	a) 1.64+/-1.88 ppb b) 1.29+/-1.12 ppb c) 2.86+/-2.78 ppb d) 2.59+/-2.60 ppb	a) Controls, normal 2nd trimester pregnancies, no missed abortions b) Low serum PCB, recent missed abortions (mean 1.62) c) High serum PCB, recent missed abortions (mean 1.50) d) Former missed abortions (mean 3.43) In missed abortions, products of conception were retained in utero at least 6 wk after fetal death, which occurred before week 20 of gestation. Women with missed abortions (mean age 28.1 yr for high PCB group) and controls (mean age 24.7 yr) GC
ADULTS; BLOOD SERUM; CHLORINE ORGANIC COMPOUNDS; DDD; DDE; DDT; DIELDRIN; HEPTACHLOR EPOXIDE; INSECTICIDES; LINDANE; PESTICIDES; POLYCHLORINATED BIPHENYLS; BIOACCUMULATION; PESTICIDE RESIDUES; PREGNANCY; ENVIRONMENTAL EXPOSURE Bercovici, B.; Wassermann, M.; Cucos, S.; Ron, M.; Wassermann, D.; Pines, A. 1983 Environmental Research 30:169-174				

Tissue	Cases Exposure Route	Range	Mean	General Information
0063 Milk				Review. Levels after occupational exposures to trace metals, solvents, and halogenated hydrocarbons, discussed in terms of milk partition factors, potential infant exposures, possible health effects.
MILK; ENVIRONMENTAL EXPOSURE; ADULTS; REVIEW; MERCURY; LEAD; DDT; DIELDRIN; POLYCHLORINATED BIPHENYLS; POLYBROMINATED BIPHENYLS; CHROMIUM; CADMIUM; HEPTACHLOR EPOXIDE; OXYCHLORDANE; BIOACCUMULATION; LACTATION; HEALTH HAZARDS Wolff, M.S. 1985 American Journal of Industrial Medicine 4:259-281				

Tissue	Cases Exposure Route	Range	Mean	General Information
0064 Milk	16	a) Not given b) Not given c) Not given d) Not given e) Not given f) Not given g) Not given h) Not given	a) 1.1 ng b) 1.4 ng c) 1.5 ng d) 1.3 ng e) 1.2 ng f) 1.1 ng g) 1.0 ng h) 1.8 ng /g whole milk	a) 7 d after parturition b) 14 d c) 28 d d) 42 d e) 56 d f) 70 d g) 84 d H) 98 d Average of samples collected at each time period. No correlation between levels in milk and blood. Accumulation of residue in infant body fat theoretically estimated to increase rapidly during 1st 3 mo of breastfeeding, eventually equal to or greater than adult levels Mothers, mean age 35+/-2 yr, mean wt 125+/-8 lb, National Capital Region, (Ottawa), Canada GC
BLOOD; MILK; ENVIRONMENTAL EXPOSURE; CANADA; ADULTS; PESTICIDES; POLYCHLORINATED BIPHENYLS; CHLORINE ORGANIC COMPOUNDS; LACTATION; PESTICIDE RESIDUES; DIELDRIN; DDT; DDE; OXYCHLORDANE; NONACHLOR; HEPTACHLOR EPOXIDE; HEXACHLOROBENZENE; BIOACCUMULATION Mes, J.; Doyle, J.A.; Adams, B.R.; Davies, D.J.; Turton, D. 1984 Archives of Environmental Contamination and Toxicology 13:217-223				

1,4:5,8-Dimethanonaphthalene, 1,2,3,4,10,10-hexachloro-6,7-epoxy-1,4,4a,5,6,7,8,8a-octahydro-, endo,exo- (8 CI) 2,7:3,6-Dimethanonaphth(2,3-b)oxirene, 3,4,5,6,9,9-hexachloro-1a,2,2a,3,6,6a,7,7a-octahydro-, (1aalpha,2beta,2aalpha,3beta,6beta,6aalpha,7beta,7aalpha)- (9 CI)
60-57-1
C12-H8-Cl6-O
MW 380.93, MP 176-177 C, VP 7.78X10(E-7) mm Hg at 20 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9965 Milk	a) 20 b) 20 c) 20 d) 20 e) 20	a) 0.012-0.040 mg/kg fat b) 0.013-0.040 mg/kg fat c) 0.011-0.037 mg/kg fat d) 0.021-0.040 mg/kg fat e) 0.011-0.025 mg/kg fat	a) 0.018+/-0.007 b) 0.021+/-0.007 c) 0.025+/-0.006 d) 0.02+/-0.005 e) 0.019+/-0.004 mg/kg fat	a) Umea, north coast b) Osterund, middle c) Stockholm, east coast d) Gothenburg, west coast e) Lund, south Range of 15 samples from mothers in each area. Samples pooled, milk collected 3-5 days postpartum. 1977-79, Sweden GC-EC

SWEDEN; MILK; DDE; DDT; DIELDRIN ; HEXACHLOROCYCLOHEXANE; HEXACHLOROBENZENE; POLYCHLORINATED BIPHENYLS; AGRICULTURE; INDUSTRIAL AREAS; LACTATION; PESTICIDE RESIDUES; POPULATION EXPOSURE; ENVIRONMENTAL EXPOSURE

Noren, K. 1983 Ambio 12(1):44-46

Tissue	Cases Exposure Route	Range	Mean	General Information
9966 Milk	1	a) 0.011-0.014 mg/kg b) 0.012-0.013 mg/kg	a) 0.013+/-0.001 mg/kg b) Not given	a) Each nursing period for 24 hr b) Sampled 1X/wk for 4 wk Fat basis GC

ADULTS; MILK; MEASUREMENT METHODS; PESTICIDES; POLYCHLORINATED BIPHENYLS; LACTATION; HEALTH HAZARDS; ENVIRONMENTAL EXPOSURE

Noren, K. 1983 Archives of Environmental Contamination and Toxicology 12:277-283

Tissue	Cases Exposure Route	Range	Mean	General Information
9967 Milk	a) 54 b) 102	a) Not detected-0.085 ppm b) Not detected-0.17 ppm	a) 0.042 +/-0.021 ppm b) 0.062+/-0.036 ppm	a) Hawaii b) Mainland USA Sampled up to 1 mo postpartum. Lipid basis. Mean of positive residues. 1979-80 GC

HAWAII; UNITED STATES; ADULTS; MILK; ALDRIN; CHLORINATED HYDROCARBONS; CHLORINE ORGANIC COMPOUNDS; DDD; DDE; DDT; DIELDRIN; HEPTACHLOR EPOXIDE; HEPTACHLOROCYCLOHEXANE; HEXACHLOROBENZENE; LINDANE; NONACHLOR; OXYCHLORDANE; POLYCHLORINATED BIPHENYLS; PESTICIDE RESIDUES; POPULATION EXPOSURE; ENVIRONMENTAL EXPOSURE

Tabei, G.H.; Kauahikaua, S.M.; Leong, G.H. 1983 Bulletin of Environmental Contamination and Toxicology 30:606-613

1,4:5,8-Dimethanonaphthalene, 1,2,3,4,10,10-hexachloro-6,7-epoxy-1,4,4a,5,6,7,8,8a-octahydro-, endo,exo- (8 CI) 2,7:3,6-Dimethanonaphth(2,3-b)oxirene, 3,4,5,6,9,9-hexachloro-1a,2,2a,3,6,6a,7,7a-octahydro-, (1aalpha,2beta,2aalpha,3beta,6beta,6aalpha,7beta,7aalpha)- (9 CI)
60-57-1
C12-H8-Cl6-O
MW 380.88, MP 176-177 C, VP 7.76X10(E-7) mm Hg at 20 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9060 Milk				Review. Chemicals found in occupational exposures are discussed in terms of milk partition factors, potential infant exposures and possible infant health effects.
LEAD; MERCURY; PESTICIDES; POLYCHLORINATED BIPHENYLS; OCCUPATIONAL HAZARDS; MILK; COMPARATIVE EVALUATIONS; REVIEW; CADMIUM; CHROMIUM; DDT; DIELDRIN; INFANTS Wolff, M.S. 1983 American Journal of Industrial Medicine 4:259-281				

Tissue	Cases Exposure Route	Range	Mean	General Information
9060 Milk, fat	a) 57 b) 4	a) 0.01-0.47 mg/kg fat b) 0.03-0.05 mg/kg fat	a) 0.04 mg/kg fat b) 0.04 mg/kg fat	a) Samples from Copenhagen (10), Naestved (8), Odense (11), Bornholm (10), Sonderborg (8), Aalborg (10). Foremilk and hindmilk collected May-Dec 1982, 4-113 days postpartum b) Pools of equal parts from 9 mothers, Copenhagen, Feb 1982 Levels similar in individual and pooled samples. No immediate health risk to infants. Mothers with normal, healthy babies, 10 with low wt babies, Denmark GC-EC
MILK; ENVIRONMENTAL EXPOSURE; DENMARK; COMPARATIVE EVALUATIONS; CHLORINATED HYDROCARBONS; CHLORINE ORGANIC COMPOUNDS; CHLOROBENZENES; DDE; DDT; DIELDRIN; HEXACHLOROCYCLOHEXANE; HEXACHLOROBENZENE; POLYCHLORINATED BIPHENYLS Andersen, J.R.; Orbaek, K. 1984 Ambio 13(4):266-268				

2(1H)-Pyridone, 3,5,6-trichloro- (8 CI); 2(1H)-Pyridinone, 3,5,6-trichloro- (9 CI)
6515-38-4
C5-H2-Cl3-N-O

Tissue	Cases Exposure Route	Range	Mean	General Information
9070 Blood	6 Ingestion Dermal	a) 0.51-1.86 ug/ml b) 0.020-0.122 ug/ml	a) 0.93 ug/ml b) 0.068 ug/ml	a) Metabolite, 6 hr after 0.5 mg/kg oral dose of chlorpyrifos b) 24 hr after 5.0 mg/kg dermal dose Levels of chloropyrifos <30 mg/ml. 70% of oral and 1.26% of dermal dose recovered in urine as metabolite. 27-50 yr old volunteers 18+/-1% depression of plasma cholinesterase GC
BLOOD; DELIBERATE EXPOSURE; ADULTS; PESTICIDES; METABOLISM Nolan, R.J.; Rick, D.L.; Freshour, N.L.; Saunders, J.H. 1984 Toxicology and Applied Pharmacology 73:8-15				

2(1H)-Pyridone, 3,5,6-trichloro- (8 CI); 2(1H)-Pyridinone, 3,5,6-trichloro- (9 CI)
6515-38-4
C5-H2-Cl3-N-O

Tissue	Cases Exposure Route	Range	Mean	General Information
9071 Urine				Review. General information, reported levels, sources of exposure, metabolites, and methods of analysis for: phthalate ester plasticizers, chlorophenoxy acid herbicides, chlorophenol biocides, p-nitrophenol, simple phenols, benzenediols, and toluene.
URINE; ENVIRONMENTAL EXPOSURE; OCCUPATIONAL EXPOSURE; DELIBERATE EXPOSURE; CONSUMER EXPOSURE; ADULTS; REVIEW; CARCINOMAS; POISONING; MEASUREMENT METHODS; PESTICIDES; INDUSTRIAL CHEMICALS; HERBICIDES; INSECTICIDES; FUNGICIDES; PENTACHLOROPHENOL; SOLVENTS; BENZENES; PHENOLS; INDUSTRIAL POLLUTION; TOLUENE; BLOOD; CARCINOGEN; METABOLISM; METABOLITES; WOOD PRESERVATIVES Patiadi, A.J. 1983 Priority Toxic Pollutants in Human Urine: Their Occurrence and Analysis, Aug. 1983, 60 p				

2-Butanone
78-93-3
C4-H8-O
MW 160.27, BP 79.57 C, VP 71.2 mm Hg at 20 C

Tissue	Cases Exposure Route	Range	Mean	General Information
9072 Blood	Inhalation	842-9675 ug/l	2630+/-2450 ug/l	End of work shift, exposure levels =/<300 ug/l. Alveolar air levels, range 4-54 ug/l, mean 26.4+/-17.9 ug/l. Italian shoe manufacturing workers GC/MS
OCCUPATIONAL EXPOSURE; METABOLISM; BIOLOGICAL MONITORING; ITALY; URINE; LUNGS; BLOOD; INDUSTRIAL CHEMICALS; INDUSTRIAL PLANTS; HYDROCARBONS Perbellini, L.; Brugnone, F.; Mozzo, P.; Cocheo, V.; Caretta, D. 1984 International Archives of Occupational and Environmental Health 54:73-81				

Tissue	Cases Exposure Route	Range	Mean	General Information
9073 Blood	144	a) Not given b) Not given c) Not given d) Not given	a) 3.1+/-1.2 ppm b) 3.7+/-1.6 ppm c) 1.0+/-0.4 ppm d) 0.5+/- 0.4 ppm	a) At 2 hr, exposure to MEK alone, 20 cases b) 4 hr, 18 cases c) 2 hr, MEK/toluene, 16 cases d) 4 hr, 14 cases Exposed 4 hr to test behavioral effects-no significant differences between MEK and mixture. 18-38 yr old healthy college students, Cincinnati, Ohio GLC

(next page)

2-Butanone
78-93-3
C4-H8-O
MW 160.27, BP 79.57 C, VP 71.2 mm Hg at 20 C

(continued)

Tissue	Cases Exposure Route	Range	Mean	General Information
9074 Breath	144	a) Not given b) Not given c) Not given d) Not given e) Not given f) Not given g) Not given	a) 5.1+/-1.2 ppm b) 7.7+/-2.1 ppm c) 9.1+/-1.3 ppm d) 1.8+/-0.6 ppm e) 4.0+/-1.2 ppm f) 4.2+/-1.3 ppm g) 0.4+/-0.4 ppm	a) At 1 hr exposure to MEK alone, 10 cases b) 2 hr, 21 cases c) 4 hr, 16 cases d) 1.5 hr post-exposure, 19 cases e) At 2 hr exposure, MEK/toluene, 16 cases f) 4 hr, 17 cases g) 1.25 hr post exposure, 16 cases Chamber levels (means): MEK alone 188.9+/-9.1 ppm, mixture, 98.3+/-0.6 ppm, MEK and 50.5+/-1.1 ppm, toluene. Exposed 4 hr to test behavioral effects. No significant difference between toluene and mixture 18-36 yr old healthy college students, Cincinnati, Ohio
BLOOD; BREATH; DELIBERATE EXPOSURE; OHIO; ADULTS; NEUROLOGIC MANIFESTATIONS; ALCOHOLS; TOLUENE; DRUGS Dick, R.B.; Setzer, J.V.; Wait, R.; Hayden, M.B.; Taylor, B.J.; Tolos, B.; Putz-Anderson, V. 1984 International Archives of Occupational and Environmental Health 54:91-109				

Tissue	Cases Exposure Route	Range	Mean	General Information
9075 Urine	Inhalation	120-1120 ug/l	487+/-277 ug/l	End of work shift, exposure levels 8-272 ug/l, mean of 101+/-67 ug/l. Statistically significant correlation between environmental and urinary levels. Italian shoe manufacturing workers GC/MS
OCCUPATIONAL EXPOSURE; METABOLISM; BIOLOGICAL MONITORING; ITALY; URINE; LUNGS; BLOOD; INDUSTRIAL CHEMICALS; INDUSTRIAL PLANTS; HYDROCARBONS Perbellini, L.; Brugnone, F.; Mozzo, P.; Cocheo, V.; Caretta, D. 1984 International Archives of Occupational and Environmental Health 54:73-81				

2,3,4,2',4',5'-Hexabromobiphenyl (No postings in CHEMLINE).

Tissue	Cases Exposure Route	Range	Mean	General Information
9076 Adipose	7 Ingestion	Not detectable-0.22 ppm	Not given	Subjects ate meat contaminated with PBBs and PCBs. Level of detection 0.001 ppm. Healthy volunteers, 20-30 yr old GC/MS
ADIPOSE TISSUE; ENVIRONMENTAL EXPOSURE; MICHIGAN; ADULTS; BIOPSIES; BROMINATED HYDROCARBONS; CHLORINATED HYDROCARBONS; DDT; DDE; DIELDRIN; FATS; LIPIDS; PESTICIDES; POLYBROMINATED BIPHENYLS; POLYCHLORINATED BIPHENYLS; ANIMAL FEEDS; ACCIDENTAL POISONING; AGRICULTURE; BIOACCUMULATION; BIOLOGICAL MONITORING; FIRE RETARDANTS; FOOD ADDITIVES; FOOD CONTAMINATION; HEALTH HAZARDS; MEAT; PESTICIDE RESIDUES; POPULATION EXPOSURE Schnare, D.W.; Ben, M.; Shields, M.G. 1984 Ambio 13(5-6):378-380				

2,3,4,5,2',3',4'-Heptabromobiphenyl (No postings in CHEMLINE).

Tissue	Cases Exposure Route	Range	Mean	General Information
9077 Adipose	7 Ingestion	Not detectable-0.26	Not given	Subjects ate meat contaminated with PBBs and PCBs. Level of detection 0.001 ppm. Healthy volunteers, 20-30 yr old GC/MS
ADIPOSE TISSUE; ENVIRONMENTAL EXPOSURE; MICHIGAN; ADULTS; BIOPSIES; BROMINATED HYDROCARBONS; CHLORINATED HYDROCARBONS; DDT; DDE; DIELDRIN; FATS; LIPIDS; PESTICIDES; POLYBROMINATED BIPHENYLS; POLYCHLORINATED BIPHENYLS; ANIMAL FEEDS; ACCIDENTAL POISONING; AGRICULTURE; BIOACCUMULATION; BIOLOGICAL MONITORING; FIRE RETARDANTS; FOOD ADDITIVES; FOOD CONTAMINATION; HEALTH HAZARDS; MEAT; PESTICIDE RESIDUES; POPULATION EXPOSURE Schnare, D.W.; Ben, M.; Shields, M.G. 1984 Ambio 13(5-6):378-380				

2,3,4,5,2',4',5'-Heptabromobiphenyl (No postings in CHEMLINE).

Tissue	Cases Exposure Route	Range	Mean	General Information
9078 Adipose	7 Ingestion	Not detectable-0.01 ppm	Not given	Subjects ate meat contaminated with PBBs and PCBs. Level of detection 0.001 ppm. Healthy volunteers, 20-30 yr old GC/MS
ADIPOSE TISSUE; ENVIRONMENTAL EXPOSURE; MICHIGAN; ADULTS; BIOPSIES; BROMINATED HYDROCARBONS; CHLORINATED HYDROCARBONS; DDT; DDE; DIELDRIN; FATS; LIPIDS; PESTICIDES; POLYBROMINATED BIPHENYLS; POLYCHLORINATED BIPHENYLS; ANIMAL FEEDS; ACCIDENTAL POISONING; AGRICULTURE; BIOACCUMULATION; BIOLOGICAL MONITORING; FIRE RETARDANTS; FOOD ADDITIVES; FOOD CONTAMINATION; HEALTH HAZARDS; MEAT; PESTICIDE RESIDUES; POPULATION EXPOSURE Schnare, D.W.; Ben, M.; Shields, M.G. 1984 Ambio 13(5-6):378-380				

2,3,4,5,3',4'-Hexachlorobiphenyl (No postings in CHEMLINE).

Tissue	Cases Exposure Route	Range	Mean	General Information
9079 Blood				Review of the relative toxicity of the individual congeners of PCBs and PCDFs identified in tissues of Yusho patients.
REVIEW; POLYCHLORINATED BIPHENYLS; ENVIRONMENTAL EXPOSURE; POLYCHLORINATED DIBENZOFURANS; ADIPOSE TISSUE; BLOOD; LIVER; JAPAN; TAIWAN Masuda, Y.; Yoshimura, H. 1984 American Journal of Industrial Medicine 5:31-44				

2,3,4,5,6,3',5'-Heptachlorobiphenyl (No postings in CHEMLINE).

Tissue	Cases Exposure Route	Range	Mean	General Information
9980 Adipose	7 Ingestion	0.06-0.59 ppm	Not given	Subjects ate meat contaminated with PBBs and PCBs. Healthy volunteers, 20-30 yr old GC/MS
ADIPOSE TISSUE; ENVIRONMENTAL EXPOSURE; MICHIGAN; ADULTS; BIOPSIES; BROMINATED HYDROCARBONS; CHLORINATED HYDROCARBONS; DDT; DDE; DIELDRIN; FATS; LIPIDS; PESTICIDES; POLYBROMINATED BIPHENYLS; POLYCHLORINATED BIPHENYLS; ANIMAL FEEDS; ACCIDENTAL POISONING; AGRICULTURE; BIOACCUMULATION; BIOLOGICAL MONITORING; FIRE RETARDANTS; FOOD ADDITIVES; FOOD CONTAMINATION; HEALTH HAZARDS; MEAT; PESTICIDE RESIDUES; POPULATION EXPOSURE Schaare, D.W.; Ben, M.; Shields, M.G. 1984 Ambio 13(5-6):378-380				

2,3,4,6-Tetrachlorobensene (No postings in CHEMLINE).

Tissue	Cases Exposure Route	Range	Mean	General Information
9981 Adipose	a) 81 b) 84	a) Not detectable-133 ng/g b) Not detectable-44 ng/g	a) 22+/-26 ng/g b) 7+/-7 ng/g	a) Kingston b) Ottawa Single sample from greater omentum of each cadaver. In general, residue values in entire survey of 20 compounds slightly higher in Kingston. No significant different among sexes. 2,3,5,6-isomer had same GC retention time. Kingston values significantly higher than in other cities. Autopsies, unembalmed cadavers: 11/7-1/81, Kingston, Ontario (a Great Lakes Community) and 11/80-1/81, Ottawa, Ontario (outside Great Lakes Basin), Canada. Age ranges 7-88, 19-91 yr respectively. GC/MS
ADIPOSE TISSUE; CANADA; AUTOPSIES; PESTICIDES; ENVIRONMENTAL EXPOSURE; CHLORINE ORGANIC COMPOUNDS; CHLOROBENZENES; WATER POLLUTION Williams, D.T.; LeBel, G.L.; Junkins, E. 1984 Journal of Toxicology and Environmental Health 13:19-29				

2,3,4,6,3',3',4'-Heptachlorobiphenyl (No postings in CHEMLINE).

Tissue	Cases Exposure Route	Range	Mean	General Information
9982 Adipose	7 Ingestion	0.007-0.28 ppm	Not given	Subjects ate meat contaminated with PBBs and PCBs. Healthy volunteers, 20-30 yr old GC/MS
ADIPOSE TISSUE; ENVIRONMENTAL EXPOSURE; MICHIGAN; ADULTS; BIOPSIES; BROMINATED HYDROCARBONS; CHLORINATED HYDROCARBONS; DDT; DDE; DIELDRIN; FATS; LIPIDS; PESTICIDES; POLYBROMINATED BIPHENYLS; POLYCHLORINATED BIPHENYLS; ANIMAL FEEDS; ACCIDENTAL POISONING; AGRICULTURE; BIOACCUMULATION; BIOLOGICAL MONITORING; FIRE RETARDANTS; FOOD ADDITIVES; FOOD CONTAMINATION; HEALTH HAZARDS; MEAT; PESTICIDE RESIDUES; POPULATION EXPOSURE Schaare, D.W.; Ben, M.; Shields, M.G. 1984 Ambio 13(5-6):378-380				

2,3,5,6,3',4',5'-Heptachlorobiphenyl (No postings in CHEMLINE).

Tissue	Cases Exposure Route	Range	Mean	General Information
9983 Adipose	7 Ingestion	0.05-0.35 ppm	Not given	Subjects ate meat contaminated with PBBs and PCBs. Healthy volunteers, 20-30 yr old GC/MS
ADIPOSE TISSUE; ENVIRONMENTAL EXPOSURE; MICHIGAN; ADULTS; BIOPSIES; BROMINATED HYDROCARBONS; CHLORINATED HYDROCARBONS; DDT; DDE; DIELDRIN; FATS; LIPIDS; PESTICIDES; POLYBROMINATED BIPHENYLS; POLYCHLORINATED BIPHENYLS; ANIMAL FEEDS; ACCIDENTAL POISONING; AGRICULTURE; BIOACCUMULATION; BIOLOGICAL MONITORING; FIRE RETARDANTS; FOOD ADDITIVES; FOOD CONTAMINATION; HEALTH HAZARDS; MEAT; PESTICIDE RESIDUES; POPULATION EXPOSURE Schnare, D.W.; Ben, M.; Shields, M.G. 1984 Ambio 13(5-6):376-380				

2,4,5,2',3',6'-Hexachlorobiphenyl (No postings in CHEMLINE).

Tissue	Cases Exposure Route	Range	Mean	General Information
9984 Adipose	7 Ingestion	0.07-0.67 ppm	Not given	Subjects ate meat contaminated with PBBs and PCBs. Healthy volunteers, 20-30 yr old GC/MS
ADIPOSE TISSUE; ENVIRONMENTAL EXPOSURE; MICHIGAN; ADULTS; BIOPSIES; BROMINATED HYDROCARBONS; CHLORINATED HYDROCARBONS; DDT; DDE; DIELDRIN; FATS; LIPIDS; PESTICIDES; POLYBROMINATED BIPHENYLS; POLYCHLORINATED BIPHENYLS; ANIMAL FEEDS; ACCIDENTAL POISONING; AGRICULTURE; BIOACCUMULATION; BIOLOGICAL MONITORING; FIRE RETARDANTS; FOOD ADDITIVES; FOOD CONTAMINATION; HEALTH HAZARDS; MEAT; PESTICIDE RESIDUES; POPULATION EXPOSURE Schnare, D.W.; Ben, M.; Shields, M.G. 1984 Ambio 13(5-6):376-380				

2,4,5,3',4',5'-Hexabromobiphenyl (No postings in CHEMLINE).

Tissue	Cases Exposure Route	Range	Mean	General Information
9985 Adipose	7 Ingestion	Not detectable-0.09 ppm	Not given	Subjects ate meat contaminated with PBBs and PCBs. Level of detection 0.001 ppm. Healthy volunteers, 20-30 yr old GC/MS
ADIPOSE TISSUE; ENVIRONMENTAL EXPOSURE; MICHIGAN; ADULTS; BIOPSIES; BROMINATED HYDROCARBONS; CHLORINATED HYDROCARBONS; DDT; DDE; DIELDRIN; FATS; LIPIDS; PESTICIDES; POLYBROMINATED BIPHENYLS; POLYCHLORINATED BIPHENYLS; ANIMAL FEEDS; ACCIDENTAL POISONING; AGRICULTURE; BIOACCUMULATION; BIOLOGICAL MONITORING; FIRE RETARDANTS; FOOD ADDITIVES; FOOD CONTAMINATION; HEALTH HAZARDS; MEAT; PESTICIDE RESIDUES; POPULATION EXPOSURE Schnare, D.W.; Ben, M.; Shields, M.G. 1984 Ambio 13(5-6):376-380				

2H-1-Benzopyran-6-ol, 3,4-dihydro-2,5,7,8-tetramethyl-2-(4,8,12-trimethyltridecyl)-, (2R-(2R*(4R*,8R*)))-
59-02-9
C29-H50-O2
MW 430.69, MP 2.5-3.5 C, BP 200-220 C at 0.1 mm Hg

Tissue	Cases Exposure Route	Range	Mean	General Information
0986 Blood, plasma	Ingestion	a) Not given b) Not given	a) 13.3+/-0.4 ug/ml b) 11.9+/-0.4 ug/ml S.E.	a) Rural b) Urban, p=0.0526 Higher levels associated with age increase. Normal range considered to be 5-12 ug/ml. 73 rural, old order armish, 82 urban residents, Columbus, Ohio 4-76 yr olds
BLOOD; BLOOD PLASMA; ERYTHROCYTES; ENVIRONMENTAL EXPOSURE; OHIO; AGE; COMPARATIVE EVALUATIONS; SELENIUM; VITAMIN E; BIOLOGICAL MONITORING; DIETS; RURAL AREAS; URBAN AREAS; BIOAVAILABILITY Snook, J.T.; Palmquist, D.L.; Moxon, A.L.; Cantor, A.H.; Vivian, V.M. 1983 American Journal of Clinical Nutrition 38:620-630				

4-Cyclohexene-1,2-dicarboximide, N-((trichloromethyl)thio)- (8 Cl); 1H-Isoindole-1,3(2H)-dione, 3a,4,7,7a-tetrahydro-2-((trichloromethyl)thio)- (9 Cl)
133-06-2
C9-H8-Cl3-N-O2-S
MW 300.57, MP 172-173 C

Tissue	Cases Exposure Route	Range	Mean	General Information
0987 Urine	12 Inhalation Dermal	a) Not given b) Not given c) Not given	a) <0.03 ppm b) 0.058 ppm c) 0.066 ppm	a) Metabolite, tetrahydrophthalimide 2-4 hr after loading, mixing, spraying most of day, wore respirator. Level same next a.m. Mean captan on clothing patches 6.72 ug/sq cm, 1 worker b) 2-4 hr after 4 hr harvesting strawberries, 3 d after captan applied, no respirators. Level in air 0.72 ug/cu m, on clothing patches 520 ug/sq cm (8-hr), 12 workers c) Same 12 workers, next a.m. Inhalation probably major route. Additional data available. Field workers in California GC
URINE; ENVIRONMENTAL EXPOSURE; OCCUPATIONAL EXPOSURE; CALIFORNIA; FUNGICIDES; AGRICULTURE; PESTICIDES; PESTICIDE RESIDUES Winterlin, W.L.; Kilgore, W.W.; Mourer, C.R.; Schoen, S.R. 1984 Journal of Agricultural and Food Chemistry 32:664-672				

4,4'-Bipyridinium, 1,1'-dimethyl-
4685-14-7
C12-H14-N2
MW 186, MP 300 C (decomp)

Tissue	Cases Exposure Route	Range	Mean	General Information
0988 Blood, plasma	5 Ingestion	0.48-0.72 mg/l	Not applicable	Initial levels upon hospital admission (2-21 hrs after ingestion). After gastric lavage, fuller's earth and mannitol. Total mass removed by charcoal hemoperfusion was 2.5-19.1 mg, low in relation to lethal dose. Two died. Patients with levels near concentration/time line separating likely survivors and non-survivors RIA
BLOOD PLASMA; CASE HISTORIES; HEMOPERFUSION; LAVAGE; HERBICIDES; DELIBERATE EXPOSURE Mascie-Taylor, B.H.; Thompson, J.; Davison, A.M. 1983 Lancet 1(8338):1376-1377				

4,4'-Bipyridinium, 1,1'-dimethyl-
4685-14-7
C12-H14-N2
MW 186, MP 300 C (decomp)

Tissue	Cases Exposure Route	Range	Mean	General Information
9989 Blood, serum	1 Ingestion	Not given	429 umol/l (80 mg/l)	At admission, 36 hr after ingesting 2 packets of "Weedol" (5 g paraquat). Improvement following radiotherapy. See critical letter: Proudfoot, A.T. and Prescott, L.P. British Medical Journal 289:112 (1984). 29 yr old Arterial oxygen pressure fell to 34 mm Hg. Dyspnea. Bilateral pulmonary shadowing. Alveolar damage, cellular proliferation, macrophages, hyaline membranes.
9990 Lung	1 Ingestion	Not given	0.28 ug/g	At admission, 36 hr after ingesting 2 packets of "Weedol" (5 g paraquat). Improvement following radiotherapy. See critical letter: Proudfoot, A.T. and Prescott, L.P. British Medical Journal 289:112 (1984). 29 yr old Arterial oxygen pressure fell to 34 mm Hg. Dyspnea. Bilateral pulmonary shadowing. Alveolar damage, cellular proliferation, macrophages, hyaline membranes.
INGESTION; PESTICIDES; DELIBERATE EXPOSURE; BLOOD SERUM; LUNGS; BIOPSIES; UNITED KINGDOM				
Webb, D.B.; Williams, M.V.; Davies, B.H.; James, K.W. 1984 British Medical Journal 288:1259-1260				

Tissue	Cases Exposure Route	Range	Mean	General Information
9991 Urine	6 Dermal	a) 0.02+/-0.02-0.06+/-0.06% b) 0.02+/-0.02-0.05+/-0.03% c) 0.01+/-0.01-0.04+-0.01%	a) Not applicable b) Not applicable c) Not applicable	a) Application to leg, % total dose, in first 4 hr. Total excretion was 0.29+/-0.02% of 9 ug/sq cm dose b) Application to hand, % total dose, in first 4 hr. Total excretion was 0.23+/-0.1% of 9 ug/sq cm dose c) Application to forearm, % total dose, in first 4 hr. Total excretion was 0.29+/-0.1% of 9 ug/sq cm dose Measured every 4 hr for 120 hr. Minimal absorption through normal skin. Volunteers Scintillation counting
URINE; DELIBERATE EXPOSURE; HERBICIDES; BIOACCUMULATION; BIOLOGICAL MONITORING; FARMS; HEALTH HAZARDS; OCCUPATIONAL HAZARDS				
Wester, R.C.; Maibach, H.I.; Bucks, D.A.W.; Aufrere, M.B. 1984 Journal of Toxicology and Environmental Health 14:759-762				

4,7-Methano-1H-indene, 1,2,3,4,5,6,7,8,8-nonachloro-2,3,3a,4,7,7a-hexahydro-, (1alpha,2beta,3alpha,3aalpha,4beta,7beta,7aalpha)-
39765-80-5
C10-H5-Cl9
MW 444.23

Tissue	Cases Exposure Route	Range	Mean	General Information
9992 Adipose	a) 56 b) 46 Ingestion		a) 5.1 ug/kg b) 3.6 ug/kg	a) Females, maximum level 40 ug/kg b) Males, maximum level 12 ug/kg. Hospital patients and accidental fatalities, 2 mo-91 yr old GC/MS

ADIPOSE TISSUE; ENVIRONMENTAL EXPOSURE; FINLAND; SEX; AGE; AUTOPSIES; BIOPSIES; CHLORINATED HYDROCARBONS; HEPTACHLOR EPOXIDE; HEXACHLOROBENZENE; DDT; POLYCHLORINATED BIPHENYLS; BIOACCUMULATION; BIOLOGICAL MONITORING; DIETS; FISHES; FOOD CONTAMINATION; HEALTH HAZARDS; POPULATION EXPOSURE

Mussalo-Rauhamaa, H.; Pyysalo, H.; Mollanen, R. 1984 Journal of Toxicology and Environmental Health 13:689-704

Tissue	Cases Exposure Route	Range	Mean	General Information
9993 Milk	16	a) Not given b) Not given c) Not given d) Not given e) Not given f) Not given g) Not given h) Not given	a) 1.2 ng b) 1.3 ng c) 1.3 ng d) 1.1 ng e) 1.0 ng f) 0.9 ng g) 0.9 ng h) 1.1 ng /g whole milk	a) 7 d after parturition b) 14 d c) 28 d d) 42 d e) 56 d f) 70 d g) 84 d H) 98 d Average of samples collected at each time period. No correlation between levels in milk and blood. Accumulation of residue in infant body fat theoretically estimated to increase rapidly during 1st 3 mo of breastfeeding, eventually equal to or greater than adult levels Mothers, mean age 35+/-2 yr, mean wt 125+/-8 lb, National Capital Region, (Ottawa), Canada GC

BLOOD; MILK; ENVIRONMENTAL EXPOSURE; CANADA; ADULTS; PESTICIDES; POLYCHLORINATED BIPHENYLS; CHLORINE ORGANIC COMPOUNDS; LACTATION; PESTICIDE RESIDUES; DIELDRIN; DDT; DDE; OXYCHLORDANE; NONACHLOR; HEPTACHLOR EPOXIDE; HEXACHLOROBENZENE; BIOACCUMULATION

Mes, J.; Doyle, J.A.; Adams, B.P.; Davies, D.J.; Turton, D. 1984 Archives of Environmental Contamination and Toxicology 13:217-223

Tissue	Cases Exposure Route	Range	Mean	General Information
9994 Milk	a) 54 b) 102	a) Not detected-0.22 ppm b) Not detected-0.47 ppm	a) 0.81+/-0.035 ppm b) 0.079+/-0.071 ppm	a) Hawaii b) Mainland USA Sampled up to 1 mo postpartum. Lipid basis. Mean of positive residues. 1979-80 GC

HAWAII; UNITED STATES; ADULTS; MILK; ALDRIN; CHLORINATED HYDROCARBONS; CHLORINE ORGANIC COMPOUNDS; DDD; DDE; DDT; DIELDRIN; HEPTACHLOR EPOXIDE; HEPTACHLOROCYCLOHEXANE; HEXACHLOROBENZENE; LINDANE; NONACHLOR; OXYCHLORDANE; POLYCHLORINATED BIPHENYLS; PESTICIDE RESIDUES; POPULATION EXPOSURE; ENVIRONMENTAL EXPOSURE

Takei, G.H.; Kauahikaua, S.M.; Leong, G.H. 1983 Bulletin of Environmental Contamination and Toxicology 30:606-613

4,7-Methano-1H-indene, 1,2,3,4,5,6,7,8,8-nonachloro-2,3,3a,4,7,7a-hexahydro-, (1alpha,2beta,3alpha,3aalpha,4beta,7beta,7aalpha)-
39765-80-5
C10-H5-Cl9
MW 444.23

Tissue	Cases Exposure Route	Range	Mean	General Information
9905 Milk	10 samples Ingestion	a) Not given b) Not given	a) 0.4 ug/kg b) 10 ug/kg	a) Milk b) Milk fat Nonsmokers, 22-38 yr old, ht 152-180 cm, wt 48-90 kg, 1-4 children, Finland. GC/MS
PESTICIDES; ADULTS; MILK; MEASUREMENT METHODS; FINLAND; DDT; DDE; DDD; HEXACHLOROBENZENE; OXYCHLORDANE; POLYCHLORINATED BIPHENYLS; POPULATION EXPOSURE; FOOD CONTAMINATION; WATER POLLUTION; NONACHLOR; ENVIRONMENTAL EXPOSURE Wickstrom, K.; Pyysalo, H.; Simes, M.S. 1983 Bulletin of Environmental Contamination and Toxicology 31:251-256				

4,7-Methanoindan, 1,2,4,5,6,7,8,8-octachloro-1,2-epoxy-3a,4,7,7a-tetrahydro- (8 Cl) 2,5-Methano-2H-indeno(1,2-b)oxirene, 1a,2,3,4,5,6a,7,7-octachloro-1a,1b,5,5a,6,6a-hexahydro- (9 Cl)
26880-48-8
C10-H4-Cl8-O
MW 428.77

Tissue	Cases Exposure Route	Range	Mean	General Information
9906 Adipose	a) 91 b) 84	a) 10-120 ng/g b) 10-110 ng/g	a) 42+/-18 ng/g b) 39+/-16 ng/g	a) Kingston b) Ottawa Single samples from greater omentum of each cadaver. Values for Kingston males/females significantly different. In general, residue values in entire survey of 20 compounds slightly higher in Kingston. Autopsies, unembalmed cadavers, 11/79-1/81, Kingston, Ontario (a Great Lakes Community) and 11/80-1/81, Ottawa, Ontario (outside Great Lakes Basin), Canada. Age ranges 7-88 yr, 16-91 yr, respectively. GC/MS
ADIPOSE TISSUE; CANADA; AUTOPSIES; PESTICIDES; ENVIRONMENTAL EXPOSURE; CHLORINE ORGANIC COMPOUNDS; CHLOROBENZENES; WATER POLLUTION Williams, D.T.; LeBel, G.L.; Junkins, E. 1984 Journal of Toxicology and Environmental Health 13:19-29				

Tissue	Cases Exposure Route	Range	Mean	General Information
9907 Adipose	a) 8 b) 10 Ingestion	a) 0.5-8.2 ug/kg b) 0.6-5.9 ug/kg	a) 4.0 ug/kg b) 2.9 ug/kg	a) Female b) Male Metabolite of heptachlor, commonly used insectide in Finnish plywood industry. Males, females, 23-83 yr old GC/MS
ADIPOSE TISSUE; ENVIRONMENTAL EXPOSURE; FINLAND; SEX; AGE; AUTOPSIES; BIOPSIES; CHLORINATED HYDROCARBONS; HEPTACHLOR EPOXIDE; HEXACHLOROBENZENE; DOT; POLYCHLORINATED BIPHENYLS; BIOACCUMULATION; BIOLOGICAL MONITORING; DIETS; FISHES; FOOD CONTAMINATION; HEALTH HAZARDS; POPULATION EXPOSURE Mussalo-Rauhamaa, H.; Pyysalo, H.; Mellanen, R. 1984 Journal of Toxicology and Environmental Health 13:689-704				

4,7-Methanoindan, 1,2,4,5,6,7,8,8-octachloro-1,2-epoxy-3a,4,7,7a-tetrahydro- (8 CI) 2,5-Methano-2H-indeno(1,2-b)oxirene, 1a,2,3,4,5,6a,7,7-octachloro-1a,1b,5,5a,6,6a-hexahydro- (9 CI)
26880-48-8
C10-H4-Cl8-O
MW 428.77

Tissue	Cases Exposure Route	Range	Mean	General Information
9998 Blood	16	a) Not given b) Not given c) Not given d) Not given e) Not given f) Not given g) Not given h) Not given	a) 0.2 ng b) 0.1 ng c) 0.2 ng d) Trace (<0.05) e) 0.5 ng f) 0.1 ng g) Trace (<0.05) h) Not detected /g whole blod	a) 7 d after parturition b) 14 d c) 28 d d) 42 d e) 56 d f) 70 d g) 84 d H) 98 d Average of samples collected at each time period. No correlation between levels in milk and blood. Mothers, mean age 35+/-2 yr, mean wt 125+/-8 lb, National Capital Region, (Ottawa), Canada GC
BLOOD; MILK; ENVIRONMENTAL EXPOSURE; CANADA; ADULTS; PESTICIDES; POLYCHLORINATED BIPHENYLS; CHLORINE ORGANIC COMPOUNDS; LACTATION; PESTICIDE RESIDUES; DIELDRIN; DDT; DDE; OXYCHLORDANE; NONACHLOR; HEPTACHLOR EPOXIDE; HEXACHLOROBENZENE; BIOACCUMULATION Mes, J.; Doyle, J.A.; Adams, B.R.; Davies, D.J.; Turton, D. 1984 Archives of Environmental Contamination and Toxicology 13:217-223				

Tissue	Cases Exposure Route	Range	Mean	General Information
9999 Milk				Review. Levels after occupational exposures to trace metals, solvents, and halogenated hydrocarbons, discussed in terms of milk partition factors, potential infant exposures, possible health effects.
MILK; ENVIRONMENTAL EXPOSURE; ADULTS; REVIEW; MERCURY; LEAD; DDT; DIELDRIN; POLYCHLORINATED BIPHENYLS; POLYBROMINATED BIPHENYLS; CHROMIUM; CADMIUM; HEPTACHLOR EPOXIDE; OXYCHLORDANE; BIOACCUMULATION; LACTATION; HEALTH HAZARDS Wolff, M.S. 1983 American Journal of Industrial Medicine 4:259-281				

4,7-Methanoindan, 1,2,4,5,6,7,8,8-octachloro-1,2-epoxy-3a,4,7,7a-tetrahydro- (8 Cl) 2,5-Methano-2H-indeno(1,2-b)oxirene, 1a,2,3,4,5,6a,7,7-octachloro-1a,1b,5,5a,6,6a-hexahydro- (9 Cl)

24880-48-8
C10-H4-Cl8-O
MW 423.77

Tissue	Cases Exposure Route	Range	Mean	General Information
10000 Milk	16	a) Not given b) Not given c) Not given d) Not given e) Not given f) Not given g) Not given h) Not given	a) 1.2 ng b) 1.5 ng c) 1.6 ng d) 1.2 ng e) 1.2 ng f) 1.1 ng g) 1.1 ng h) 1.3 ng /g whole milk	a) 7 d after parturition b) 14 d c) 28 d d) 42 d e) 56 d f) 70 d g) 84 d H) 98 d Average of samples collected at each time period. No correlation between levels in milk and blood. Accumulation of residue in infant body fat theoretically estimated to increase rapidly during 1st 3 mo of breastfeeding, eventually equal to or greater than adult levels Mothers, mean age 35+/-3 yr, mean wt 135+/-8 lb, National Capital Region, (Ottawa), Canada GC

BLOOD; MILK; ENVIRONMENTAL EXPOSURE; CANADA; ADULTS; PESTICIDES; POLYCHLORINATED BIPHENYLS; CHLORINE ORGANIC COMPOUNDS; LACTATION; PESTICIDE RESIDUES; DIELDRIN; DDT; DDE; OXYCHLORDANE; NONACHLOR; HEPTACHLOR EPOXIDE; HEXACHLOROBENZENE; BIOACCUMULATION

Mes, J.; Doyle, J.A.; Adams, B.R.; Device, D.J.; Turton, D. 1984 Archives of Environmental Contamination and Toxicology 13:317-325

Tissue	Cases Exposure Route	Range	Mean	General Information
10001 Milk	a) 84 b) 102	a) 0.011-0.55 ppm b) Not detected-0.44 ppm	a) 0.068+/-0.45 ppm b) 0.054+/-0.049 ppm	a) Hawaii b) Mainland USA Sampled up to 1 mo postpartum. Lipid basis. Mean of positive residues. 1975-80 GC

HAWAII; UNITED STATES; ADULTS; MILK; ALDRIN; CHLORINATED HYDROCARBONS; CHLORINE ORGANIC COMPOUNDS; DDD; DDE; DDT; DIELDRIN; HEPTACHLOR EPOXIDE; HEPTACHLOROCYCLOHEXANE; HEXACHLOROBENZENE; LINDANE; NONACHLOR; OXYCHLORDANE; POLYCHLORINATED BIPHENYLS; PESTICIDE RESIDUES; POPULATION EXPOSURE; ENVIRONMENTAL EXPOSURE

Takei, G.H.; Kawahikaua, S.M.; Leong, J.H. 1983 Bulletin of Environmental Contamination and Toxicology 30:606-613

Tissue	Cases Exposure Route	Range	Mean	General Information
10002 Milk	10 samples Ingestion	a) Not given b) Not given	a) 0.2 ug/kg b) 5 ug/kg	a) Milk b) Milk fat Nonsmokers, 22-38 yr old, ht 152-180 cm, wt 48-90 kg, 1-4 children, Finland. GC/MS

PESTICIDES; ADULTS; MILK; MEASUREMENT METHODS; FINLAND; DDT; DDE; DDD; HEXACHLOROBENZENE; OXYCHLORDANE; POLYCHLORINATED BIPHENYLS; POPULATION EXPOSURE; FOOD CONTAMINATION; WATER POLLUTION; NONACHLOR; ENVIRONMENTAL EXPOSURE

Wickstrom, K.; Pyysalo, H.; Simes, M.S. 1983 Bulletin of Environmental Contamination and Toxicology 31:251-256

4,7-Methanoindan, 1,2,4,5,6,7,8,8-octachloro-1,2-epoxy-3a,4,7,7a-tetrahydro- (8 CI) 2,5-Methano-2H-indeno(1,2-b)oxirene, 1a,2,3,4,5,6a,7,7-octachloro-1a,1b,5,5a,6,6a-hexahydro- (9 CI)
26880-48-8
C10-H4-Cl8-O
MW 428.77

Tissue	Cases Exposure Route	Range	Mean	General Information
10008 Milk				Review. Chemicals found in occupational exposures are discussed in terms of milk partition factors, potential infant exposures and possible infant health effects.

LEAD; MERCURY; PESTICIDES; POLYCHLORINATED BIPHENYLS; OCCUPATIONAL HAZARDS; MILK; COMPARATIVE EVALUATIONS; REVIEW; CADMIUM; CHROMIUM; DDT; DIELDRIN, INFANTS

Wolf, M.S. 1983 American Journal of Industrial Medicine 4:259-281

4,7-Methanoindan, 1,4,5,6,7,8,8-heptachloro-2,3-epoxy-3a,4,7,7a-tetrahydro- (8 CI); 2,5-Methano-2H-indeno(1,2-b)oxirene, 2,3,4,5,6,7,7-heptachloro-1a,1b,5,5a,6,6a-hexahydro-, (1aalpha,1bbeta,2alpha,5alpha,5abeta,6beta,6aalpha)- (9 CI)
1024-57-3
C10-H5-Cl7-O
MW 389.40, MP 160-161.5 C

Tissue	Cases Exposure Route	Range	Mean	General Information
10004 Adipose	a) 91 b) 84	a) 10-11[illegible] ng/g b) 10-130 ng/g	a) 35+/-30 ng/g b) 37+/-21 ng/g	a) Kingston b) Ottawa Single samples from greater omentum of each cadaver. In general, residue values in entire survey of 20 compounds slightly higher in Kingston. No significant differences by sex Autopsies, unembalmed cadavers, 11/79-1/81, Kingston, Ontario (a Great Lakes Community) and 11/80-1/81, Ottawa, Ontario (outside Great Lakes Basin), Canada. Age ranges 7-88 yr, 16-91 yr, respectively. GC/MS

ADIPOSE TISSUE; CANADA; AUTOPSIES; PESTICIDES; ENVIRONMENTAL EXPOSURE; CHLORINE ORGANIC COMPOUNDS; CHLOROBENZENES; WATER POLLUTION

Williams, D.T.; LeBel, G.L.; Junkins, E. 1984 Journal of Toxicology and Environmental Health 13:19-29

Tissue	Cases Exposure Route	Range	Mean	General Information
10006 Adipose	a) 8 b) 10 Ingestion	a) 0.8-7.4 ug/kg b) 0.3-4.2 ug/kg	a) 2.7 ug/kg b) 1.9 ug/kg	a) Female b) Male Metabolite of heptachlor, commonly used insectide in Finnish plywood industry. Males, females, 20-83 yr old GC/MS

ADIPOSE TISSUE; ENVIRONMENTAL EXPOSURE; FINLAND; SEX; AGE; AUTOPSIES; BIOPSIES; CHLORINATED HYDROCARBONS; HEPTACHLOR EPOXIDE; HEXACHLOROBENZENE; DDT; POLYCHLORINATED BIPHENYLS; BIOACCUMULATION; BIOLOGICAL MONITORING; DIETS; FISHES; FOOD CONTAMINATION; HEALTH HAZARDS; POPULATION EXPOSURE

Mussalo-Rauhamaa, H.; Pyysalo, H.; Mollanen, R. 1984 Journal of Toxicology and Environmental Health 13:689-704

4,7-Methanoindan, 1,4,5,6,7,8,8-heptachloro-2,3-epoxy-3a,4,7,7a-tetrahydro- (8 Cl); 2,5-Methano-2H-indeno(1,2-b)oxirene, 2,3,4,5,6,7,7-heptachloro-1a,1b,5,5a,6,6a-hexahydro-, (1aalpha,1bbeta,2alpha,5alpha,5abeta,6beta,6aalpha)- (9 Cl)
1024-57-3
C10-H6-Cl7-O
MW 389.40, MP 160-161.5 C

Tissue	Cases Exposure Route	Range	Mean	General Information
10006 Adipose	7 Ingestion	0.20-0.82 ppm	Not given	Subjects ate meat contaminated with chlorinated pesticides Healthy volunteers, 20-30 yr old GC/MS

ADIPOSE TISSUE; ENVIRONMENTAL EXPOSURE; MICHIGAN; ADULTS; BIOPSIES; BROMINATED HYDROCARBONS; CHLORINATED HYDROCARBONS; DDT; DDE; DIELDRIN; FATS; LIPIDS; PESTICIDES; POLYBROMINATED BIPHENYLS; POLYCHLORINATED BIPHENYLS; ANIMAL FEEDS; ACCIDENTAL POISONING; AGRICULTURE; BIOACCUMULATION; BIOLOGICAL MONITORING; FIRE RETARDANTS; FOOD ADDITIVES; FOOD CONTAMINATION; HEALTH HAZARDS; MEAT; PESTICIDE RESIDUES; POPULATION EXPOSURE
Schnare, D.W.; Ben, M.; Shields, M.G. 1984 Ambio 13(5-6):378-380

Tissue	Cases Exposure Route	Range	Mean	General Information
10007 Blood, serum	a) 7 b) 8 c) 9 d) 7	a) Not given b) Not given c) Not given d) Not given	a) 4.50+/-1.77 ppb b) 4.00+/-2.37 ppb c) 3.80+/-2.93 ppb d) 2.49+/-0.48 ppb	a) Controls, normal 2nd trimester pregnancies, no missed abortions b) Low serum PCB, recent missed abortions (mean 1.62) c) High serum PCB, recent missed abortions (mean 1.50) d) Former missed abortions (mean 3.43) In missed abortions, products of conception were retained in utero at least 6 wk after fetal death, which occurred before week 20 of gestation. Women with missed abortions (mean age 26.1 yr for high PCB group) and controls (mean age 24.7 yr) GC

ADULTS; BLOOD SERUM; CHLORINE ORGANIC COMPOUNDS; DDD; DDE; DDT; DIELDRIN; HEPTACHLOR EPOXIDE; INSECTICIDES; LINDANE; PESTICIDES; POLYCHLORINATED BIPHENYLS; BIOACCUMULATION; PESTICIDE RESIDUES; PREGNANCY; ENVIRONMENTAL EXPOSURE
Bercovici, B.; Wassermann, M.; Cucos, S.; Ron, M.; Wassermann, D.; Pines, A. 1983 Environmental Research 30:169-174

Tissue	Cases Exposure Route	Range	Mean	General Information
10008 Milk				Review. Levels after occupational exposures to trace metals, solvents, and halogenated hydrocarbons, discussed in terms of milk partition factors, potential infant exposures, possible health effects.

MILK; ENVIRONMENTAL EXPOSURE; ADULTS; REVIEW; MERCURY; LEAD; DDT; DIELDRIN; POLYCHLORINATED BIPHENYLS; POLYBROMINATED BIPHENYLS; CHROMIUM; CADMIUM; HEPTACHLOR EPOXIDE; OXYCHLORDANE; BIOACCUMULATION; LACTATION; HEALTH HAZARDS
Wolff, M.S. 1983 American Journal of Industrial Medicine 4:259-281

4,7-Methanoindan, 1,4,5,6,7,8,8-heptachloro-2,3-epoxy-3a,4,7,7a-tetrahydro- (8 CI); 2,5-Methano-2H-indeno(1,2-b)oxirene, 2,3,4,5,6,7,7-heptachloro-1a,1b,5,5a,6,6a-hexahydro-, (1aalpha,1bbeta,2alpha,5alpha,5abeta,6beta,6aalpha)- (9 CI)
1024-57-3
C10-H6-Cl7-O
MW 389.40, MP 160-161.5 C

Tissue	Cases Exposure Route	Range	Mean	General Information
10000 Milk	16	a) Not given b) Not given c) Not given d) Not given e) Not given f) Not given g) Not given h) Not given	a) 0.9 ng b) 1.4 ng c) 1.4 ng d) 1.2 ng e) 1.1 ng f) 1.0 ng g) 1.0 ng h) 1.4 ng /g whole milk	a) 7 d after parturition b) 14 d c) 28 d d) 42 d e) 56 d f) 70 d g) 84 d H) 98 d Average of samples collected at each time period. No correlation between levels in milk and blood. Accumulation of residue in infant body fat theoretically estimated to increase rapidly during 1st 3 mo of breastfeeding, eventually equal to or greater than adult levels Mothers, mean age 38+/-2 yr, mean wt 125+/-8 lb, National Capital Region, (Ottawa), Canada GC

BLOOD; MILK; ENVIRONMENTAL EXPOSURE; CANADA; ADULTS; PESTICIDES; POLYCHLORINATED BIPHENYLS; CHLORINE ORGANIC COMPOUNDS; LACTATION; PESTICIDE RESIDUES; DIELDRIN; DDT; DDE; OXYCHLORDANE; NONACHLOR; HEPTACHLOR EPOXIDE; HEXACHLOROBENZENE; BIOACCUMULATION
Mes, J.; Doyle, J.A.; Adams, B.R.; Davies, D.J.; Turton, D. 1984 Archives of Environmental Contamination and Toxicology 13:217-223

Tissue	Cases Exposure Route	Range	Mean	General Information
10010 Milk	a) 84 b) 102	a) 0.014-0.068 ppm b) Not detected-0.20 ppm	a) 0.036+/-0.013 ppm b) 0.055+/-0.039 ppm	a) Hawaii b) Mainland USA Sampled up to 1 mo postpartum. Lipid basis. Mean of positive residues. 1970-80 GC

HAWAII; UNITED STATES; ADULTS; MILK; ALDRIN; CHLORINATED HYDROCARBONS; CHLORINE ORGANIC COMPOUNDS; DDD; DDE; DDT; DIELDRIN; HEPTACHLOR EPOXIDE; HEPTACHLOROCYCLOHEXANE; HEXACHLOROBENZENE; LINDANE; NONACHLOR; OXYCHLORDANE; POLYCHLORINATED BIPHENYLS; PESTICIDE RESIDUES; POPULATION EXPOSURE; ENVIRONMENTAL EXPOSURE
Tabei, G.H.; Kanahiwa, S.M.; Leong, G.H. 1983 Bulletin of Environmental Contamination and Toxicology 30:606-613

Tissue	Cases Exposure Route	Range	Mean	General Information
10011 Milk				Review. Chemicals found in occupational exposures are discussed in terms of milk partition factors, potential infant exposures and possible infant health effects.

LEAD; MERCURY; PESTICIDES; POLYCHLORINATED BIPHENYLS; OCCUPATIONAL HAZARDS; MILK; COMPARATIVE EVALUATIONS; REVIEW; CADMIUM; CHROMIUM; DDT; DIELDRIN; INFANTS
Wolff, M.S. 1983 American Journal of Industrial Medicine 4:259-281

4,7-Methanoindan, 1,4,5,6,7,8,8-heptachloro-2,3-epoxy-3a,4,7,7a-tetrahydro- (8 Cl); 2,5-Methano-2H-indeno(1,2-b)oxirene, 2,3,4,5,6,7,7-heptachloro-1a,1b,5,5a,6,6a-hexahydro-, (1aalpha,1bbeta,2alpha,5alpha,5abeta,6beta,6aalpha)- (9 Cl)
1024-57-3
C10-H6-Cl7-O
MW 389.40, MP 160-161.5 C

Tissue	Cases Exposure Route	Range	Mean	General Information
10012 Milk, fat	57	0.01-0.04 mg/kg fat	Not given	Samples from Copenhagen (10), Naestved (8), Odense (11), Bornholm (10),Sonderborg (8), Aalborg (10). Foremilk and hindmilk collected May-Dec 1982, 4-113 days postpartum. Detected in 56 of 57 samples. Mothers with normal, healthy babies, 10 with low wt babies, Denmark GC-EC
MILK; ENVIRONMENTAL EXPOSURE; DENMARK; COMPARATIVE EVALUATIONS; CHLORINATED HYDROCARBONS; CHLORINE ORGANIC COMPOUNDS; CHLOROBENZENES; DDE; DDT; DIELDRIN; HEXACHLOROCYCLOHEXANE; HEXACHLOROBENZENE; POLYCHLORINATED BIPHENYLS Andersen, J.R.; Orbaek, K. 1984 Ambio 13(4):266-268				

4,7-Methanoindan, 1alpha,2alpha,4beta,5,6,7beta,8,8-octachloro-3aalpha,4,7,7aalpha-tetrahydro (8 Cl) 4,7-Methano-1H-indene, 1,2,4,5,6,7,8,8-octachloro-2,3,3a,4,7,7a-hexahydro-, (1alpha,2alpha,3aalpha,4beta,7beta,7aalpha)- (9 Cl)
5103-71-9
C10-H6-Cl8
MW 409.76

Tissue	Cases Exposure Route	Range	Mean	General Information
10013 Adipose	a) 91 b) 84	a) Not detected-80 ng/g b) 10-30 ng/g	a) 18+/-16 ng/g b) 16+/-6 ng/g	a) Kingston b) Ottawa Single samples from greater omentum of each cadaver. In general, residue values in entire survey of 20 compounds slightly higher in Kingston. No significant differences by sex Autopsies, unembalmed cadavers, 11/79-1/81, Kingston, Ontario (a Great Lakes Community) and 11/80-1/81, Ottawa, Ontario (outside Great Lakes Basin), Canada. Age ranges 7-88 yr, 16-91 yr, respectively. GC/MS
ADIPOSE TISSUE; CANADA; AUTOPSIES; PESTICIDES; ENVIRONMENTAL EXPOSURE; CHLORINE ORGANIC COMPOUNDS; CHLOROBENZENES; WATER POLLUTION Williams, D.T.; LeBel, G.L.; Junkins, E. 1984 Journal of Toxicology and Environmental Health 13:19-29				

Tissue	Cases Exposure Route	Range	Mean	General Information
10014 Milk	10 samples Ingestion	a) Not given b) Not given	a) <0.05 ug/kg b) <1 ug/kg	a) Milk b) Milk fat Nonsmokers, 22-38 yr old, ht 152-180 cm, wt 46-90 kg, 1-4 children, Finland. GC/MS
PESTICIDES; ADULTS; MILK; MEASUREMENT METHODS; FINLAND; DDT; DDE; DDD; HEXACHLOROBENZENE; OXYCHLORDANE; POLYCHLORINATED BIPHENYLS; POPULATION EXPOSURE; FOOD CONTAMINATION; WATER POLLUTION; NONACHLOR; ENVIRONMENTAL EXPOSURE Wickstrom, K.; Pyysalo, H.; Simes, M.S. 1983 Bulletin of Environmental Contamination and Toxicology 31:251-256				

4,7-Methanoindan, 1beta,2alpha,4alpha,5,6,7alpha,8,8-octachloro-3abeta,4,7,7abeta-tetrahydro- (8 CI) 4,7-Methano-1H-indene, 1,2,4,5,6,7,8,8-octachloro-2,3,3a,4,7,7a-hexahydro-, (1alpha,2beta,3aalpha,4beta,7beta,7aalpha)- (9 CI)
5103-74-2
C10-H6-Cl8
MW 409.76

Tissue	Cases Exposure Route	Range	Mean	General Information
10015 Milk	10 samples Ingestion	a) Not given b) Not given	a) <0.05 ug/kg b) <1 ug/kg	a) Milk b) Milk fat Nonsmokers, 22-38 yr old, ht 152-180 cm, wt 48-90 kg, 1-4 children, Finland. GC/MS
PESTICIDES; ADULTS; MILK; MEASUREMENT METHODS; FINLAND; DDT; DDE; DDD; HEXACHLOROBENZENE; OXYCHLORDANE; POLYCHLORINATED BIPHENYLS; POPULATION EXPOSURE; FOOD CONTAMINATION; WATER POLLUTION; NONACHLOR; ENVIRONMENTAL EXPOSURE Wichstrom, K.; Pyysalo, H.; Simes, M.S. 1983 Bulletin of Environmental Contamination and Toxicology 31:251-256				

5-Thia-1-azabicyclo(4.2.0)oct-2-ene-2-carboxylic acid, 3-((acetyloxy)methyl)-7-(((2-amino-4-thiazolyl)(methoxyimino)acetyl)amino)-8-oxo -, (6R-trans)-
60846-21-1
C16-H17-N5-O7-S2
MW 455.50

Tissue	Cases Exposure Route	Range	Mean	General Information
10016 Milk				Review. Levels after occupational exposures to trace metals, solvents, and halogenated hydrocarbons, discussed in terms of milk partition factors, potential infant exposures, possible health effects.
MILK; ENVIRONMENTAL EXPOSURE; ADULTS; REVIEW; MERCURY; LEAD; DDT; DIELDRIN; POLYCHLORINATED BIPHENYLS; POLYBROMINATED BIPHENYLS; CHROMIUM; CADMIUM; HEPTACHLOR EPOXIDE; OXYCHLORDANE; BIOACCUMULATION; LACTATION; HEALTH HAZARDS Wolff, M.S. 1983 American Journal of Industrial Medicine 4:259-281				

9,10-Secoergosta-5,7,10(19),22-tetraene-3beta,25-diol (8 CI); 9,10-Secoergosta-5,7,10(19),22-tetraene-3,25-diol, (3beta,5Z,7E,22E)- (9 CI)
21343-40-8
C28-H44-O2

Tissue	Cases Exposure Route	Range	Mean	General Information
10017 Milk				Review of levels of vitamin D and metabolites measured in human breast milk by various methods.
MILK; VITAMIN D; METABOLITES; REVIEW; MEASUREMENT METHODS; LACTATION; NUTRITIONAL DEFICIENCIES; DIETS; DRUGS Makin, H.L.J.; Seamark, D.A.; Trafford, D.J.H. 1983 Archives of Disease in Childhood 58(9):750-753				

50272-101

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15. Supplementary Notes

16. Abstract (Limit: 200 words)

The database provides a central source of systematically collected and organized body-burden data that facilitates the early identification of actual or potential human exposure to environmental contaminants and the assessment of the significance of such exposure. Data included are obtained through routine manual searches of selected scientific journals, augmented by computer searches.

The database, which includes the separately published files, Chemicals Identified in Human Biological Media and Chemicals Identified in Feral and Food Animals, contains information on more than 1600 chemicals. The database is used in exposure, hazard and risk assessment; identifying potential human and environmental health problems including sources of contamination; planning research and comparing results; and in teaching at medical and public health schools.

The database is under the aegis of the Interagency Collaborative Group on Environmental Carcinogenesis, National Cancer Institute (NCI) and is maintained by the Health and Environmental Information Section, Science Applications International Corporation under the direction of the Exposure Evaluation Division, U.S. Environmental Protection Agency (EPA). Funding is provided through interagency agreements involving NCI, EPA, and the U.S. Department of Energy.

17. Document Analysis a. Descriptors

Body burden
Human tissues/body fluids
Residues

b. Identifiers/Open-Ended Terms

c. COSATI Field/Group

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